RECLAMATION

Managing Water in the West

Draft Environmental Assessment and Finding of No Significant Impact

Glenn-Colusa Irrigation District
Stony Creek Fan Aquifer Performance Testing Plan

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

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Mid-Pacific Region
Sacramento, CA

FINDING OF NO SIGNIFICANT IMPACT

GLENN COLUSA IRRIGATION DISTRICT STONY CREEK FAN AQUIFER PERFORMANCE TESTING PLAN

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FINDING OF NO SIGNIFICANT IMPACT
GLENN-COLUSA IRRIGATION DISTRICT STONY CREEK FAN AQUIFER PERFORMANCE TESTING PLAN

Glenn Colusa Irrigation District (GCID) has been cooperating with neighboring water purveyors, the Bureau of Reclamation (Reclamation), the California Department of Water Resources (DWR), and other parties for several years on regional water management planning in the Sacramento Valley. One of GCID's planning activities is the Stony Creek Fan Conjunctive Water Management Program (SCF Program), a collaborative effort among GCID, the Orland Unit Water Users Association (OUWUA), and Orland-Artois Water District (OAWD), collectively referred to as the SCF Partners. The SCF Partners are seeking solutions to local water management problems in a regional, cooperative context.

The current emphasis of the SCF Program is the exploration of regional aquifer systems to better define the physical and operational characteristics of those systems, and to better understand the potential effects of ongoing and potential future groundwater development. This involves physical testing of the aquifer systems according to a proposed Aquifer Performance Testing Plan (APTP) developed by the SCF Partners. The proposed action involves funding from Reclamation in support of the SCF Partners APTP.

An Environmental Assessment (EA) was prepared that evaluates the potential environmental impacts associated with the proposed action and a no action alternative. The EA is attached for reference. In accordance with the National Environmental Policy Act of 1969, as amended, Reclamation has found that the implementation of the SCF APTP will not result in a significant adverse impact on the environment. Therefore, an Environmental Impact Statement is not required.

This Finding of No Significant Impact (FONSI) is based upon the following:

1. Surface water resources: The proposed action will not result in a substantial change or impact to GCID, OUWUA or OAWD operations. Pumped groundwater will be delivered within the SCF Partners service areas using existing conveyance facilities. The conveyance of water will not adversely impact existing water supplies. Instead surface water will be augmented with groundwater.

2. Groundwater Resources: Implementation of the Glenn County Groundwater Management Plan during the aquifer performance testing plan will ensure that the proposed action will not result in any significant adverse effect to existing groundwater levels.

3. Land Use: The Proposed action will not adversely impact land management or agricultural practices within GCID, OUWUA or OAWD. Construction activities will be limited to the small areas as defined in the EA. Construction equipment will be brought on site using existing surface and gravel roads.

4. Air Quality: There will be temporary impacts to air quality due to emission of air pollutants during the period of construction. Permits will be acquired for the emission of air pollutants if required. It is estimated that each well would require approximately 112 hours (about 5 days) of equipment operation. Due to the short duration of construction, there will not be significant adverse impacts to air quality. Additionally, the production wells are electric and would not have any impacts on air quality.

5. Biological Resources- The proposed action will not result in any physical changes to the environment resulting in significant adverse impacts to biological resources. In accordance with Section 7 of the Endangered Species Act (ESA), Reclamation is consulting with the United States Fish and Wildlife Service for effects to the giant garter snake. Section 7 ESA consultation will be complete prior to the finalization of this FONSI.

6. The absence of Indian Trust Assets (ITA) in areas affected by the proposed action precludes any impact. The nearest ITA is the Paskenta Rancheria which is approximately 13 miles NW of the project location.

7. Minority or disadvantaged populations or communities will not be adversely impacted by the proposed action. The proposed action will not cause dislocation or changes in employment to minority or disadvantaged populations or communities within Glenn County. Flooding, drought and disease are not impacts that will not occur as a result of the proposed action.

8. Based on the analysis in the EA, cultural resources will not be adversely impacted as a result of the proposed action. There is no potential to affect historic properties as a result of the proposed action. In accordance with the National Historic Preservation Act, Reclamation is completing consultation with the California Office of Historic Preservation (SHPO). Completion of this consultation will be completed prior to implementation of the proposed action.

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Section 1 Purpose and Need for Action

1.1 *Introduction*

Glenn-Colusa Irrigation District (GCID) has been cooperating with neighboring water purveyors, the Bureau of Reclamation (Reclamation), the California Department of Water Resources (DWR), and other parties for several years on regional water management planning in the Sacramento Valley. One of GCID's planning activities is the Stony Creek Fan Conjunctive Water Management Program (SCF Program), a collaborative effort among GCID, the Orland Unit Water Users Association (OUWUA), and Orland-Artois Water District (OAWD), collectively referred to as the SCF Partners. The SCF Partners are seeking solutions to local water management problems in a regional, cooperative context.

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GCID, on behalf of the SCF Partners, has completed a California Environmental Quality Act (CEQA) compliance document for its proposed action to implement the APTP. That document is appended to this Environmental Assessment as Appendix A.

1.2 *Background*

The SCF Partners formalized their cooperative relationship in 2001 through a memorandum of understanding (MOU) that was subsequently renewed and updated in 2006. Pursuant to the MOU, the SCF Partners have conducted an initial feasibility investigation of conjunctive water management within their service areas, tested groundwater recharge by surface spreading, participated in development of the Stony Creek Fan Integrated Groundwater and Surface Water Model [1](SCFIGSM), conducted outreach to inform neighboring counties, districts and others of their activities and findings, and undertaken various other related activities. Figure 1 shows the

[1] The Stony Creek Fan Integrated Groundwater and Surface Water Model was developed through the collaborative efforts of interested parties in Glenn County, including the SCF Partners and the County of Glenn. The model enables simulation of alternative groundwater and surface water management strategies and potential projects in the Eastern Glenn County region. The model was completed in 2004. Funding for model development was provided by the California Department of Water Resources.

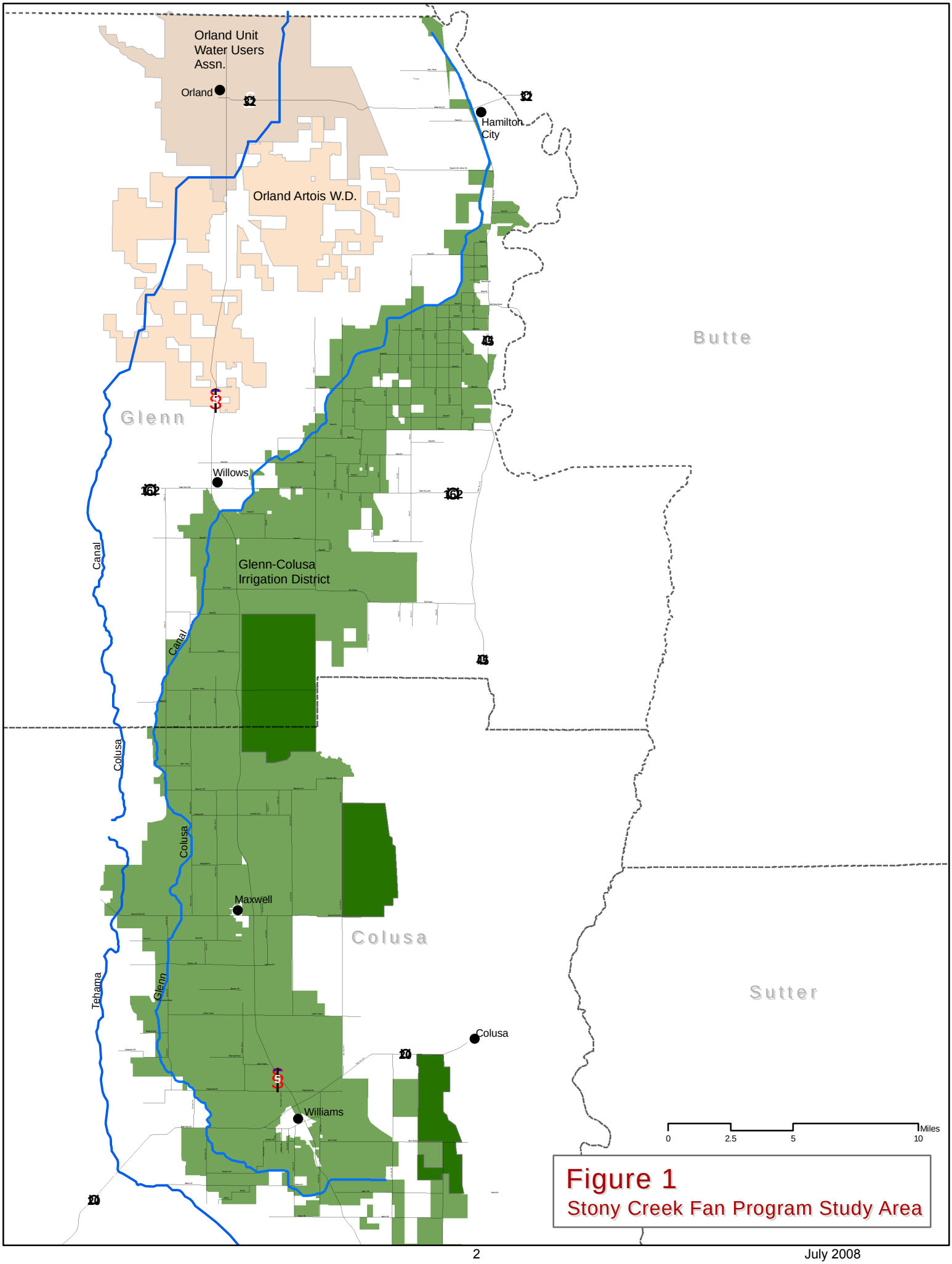


Figure 1

Stony Creek Fan Program Study Area

locations of SCF Partner's respective service areas, which collectively comprise the SCF Program Study Area.

Collectively, the SCF Partners provide surface water supplies to more than 210,000 acres of irrigated lands and wildlife refuges, including nearly 130,000 acres in Glenn County. Additionally, there are about 75,000 acres of irrigated lands in Glenn County that currently rely exclusively on groundwater pumping each year. Surface water supplies provided by the SCF Partners and other surface water purveyors[2] are critically important for sustaining Glenn County's water supply and economic vitality. Surface water supplies provided by the SCF Partners meet a large portion of the irrigation water demand in Glenn County.[3] Based on water balance analyses developed for this area, deep percolation of applied surface water within the SCF Partners' service areas[4] contributes about 180,000 acre-feet annually of groundwater recharge[5]. Groundwater monitoring and mapping reveals that recharged groundwater migrates outside of the SCF Partners' service area and benefits surrounding lands that rely exclusively on groundwater for irrigation and other purposes. Thus, the Glenn County area has and continues to rely on conjunctive use of surface water and groundwater supplies to satisfy its water needs. The APTP would complement this ongoing conjunctive use by characterizing the extent and distribution of the multiple aquifer systems in the SCF Partners' service areas.

1.3 *Purpose and Need*

Water demands in the Sacramento Valley continue to grow while developed supplies have not increased appreciably over the past several decades. Population growth and economic development in the region are resulting in both larger and firmer water demands. Changes in irrigated agricultural practices are increasing the demand for water. Additionally, there are important environmental water uses that need to be protected or expanded to sustain the Valley's rich and diverse natural habitats.

Because essentially no new surface water supplies have been developed in the Sacramento Valley for several decades, and because groundwater can be readily developed at most locations within the Valley, new water demands are being met primarily through development and use of groundwater by private landowners, irrigation and water districts, towns and cities, industries, and others. Yet, despite this ongoing trend of increasing groundwater development and use, there is a lack of information regarding the characteristics of the Valley's groundwater systems

[2] Other surface water purveyors serving Glenn County lands are Glide WD, Kanawha WD, Princeton-Codora-Glenn ID, Provident ID, Willow Creek MWC, RD 2106, and Western Canal WD.

[3] Under current conditions, water use in the SCF Partners' service areas is predominately for agricultural irrigation, and the primary sources of supply are surface water. Groundwater serves as a supplemental supply source, with the amount of groundwater pumped being dependent on the availability of surface water supplies, which varies from year to year. The proportions of surface water and groundwater use also vary among the SCF Partners, with OAWD having the least reliable surface water supply and, consequently, the largest amount of groundwater pumping on a per acre basis. To avoid potential local water user impacts in the Tehama Formation, the Lower Tuscan Formation could provide an alternative supply to relieve some of the demand in the upper aquifers underlying OAWD. Per acre pumping amounts are lower in GCID and the OUWUA due to the relatively high reliability of their surface supplies. However, surface water shortages also occur occasionally in both GCID and the OUWUA.

[4] Includes only the Glenn County portion of GCID.

[5] Based on water balance analyses conducted in relation to the SCF Feasibility Investigation for the 1970 through 2000 period (Technical Memorandum No. 3, Davids Engineering, 2006).

and how they behave. Due to these information gaps, the capability of the aquifers to sustain current and future regional water demands, and possibly to meet water needs outside the region, is unknown.

The purpose of the proposed SCF APTP is to develop important information that is currently lacking and is needed to responsibly plan groundwater development and management within the SCF Program study area and adjoining areas that share the underlying aquifer systems. Through a program of planned testing, the SCF APTP would yield scientific information about aquifer characteristics. Among other uses, this information would assist in formulating sustainable conjunctive management strategies, be incorporated into existing and new analytical tools and numeric models of groundwater systems, including the SCFIGSM; provide a basis for evaluating possible impacts to existing groundwater users; and, assist in understanding aquifer recharge mechanisms and how recharge areas and mechanisms could be protected.

Section 2 Alternatives Including the Proposed Action

2.1 *No Action*

Under the No Action alternative, the SCF APTP would not be implemented in the manner that is proposed with federal funding, which involves coordinated actions among neighboring water purveyors, high levels of scientific rigor and quality control; and wide dissemination of information. However, efforts by individual entities to understand groundwater conditions would likely continue in piecemeal fashion, subject to the constraints of available local resources. Opportunities to increase reliable water supplies through conjunctive management of groundwater and surface water would be explored at a much slower pace and with less scientific rigor. Findings would not be as widely shared. Ongoing groundwater development would continue, limited by the existing level of data to scientifically assess the implications or sustainability of implementing such actions.

2.2 *Proposed Action*

2.2.1 SCF Aquifer Performance Testing Plan

2.2.1.1 Overview of Testing Plan Elements, Phasing and Institutional Framework

The SCF APTP defines a research program in Glenn County that includes drilling up to five test holes, installing up to seven test-production wells, and conducting well efficiency and aquifer performance testing. Well drilling would help characterize the extent and distribution of the multiple aquifer systems within the SCF APTP study area. The test-production wells would be constructed to focus production on the deeper aquifer systems. The aquifer performance testing and monitoring would be conducted to help identify the aquifer properties surrounding the individual test-production wells, and the regional interaction between the shallower and deeper aquifer systems. In order to accomplish this goal, aquifer performance testing would be conducted using single and multiple test-production wells during irrigation and non-irrigation periods.

The SCF APTP would be implemented in three phases. During Phase 1, the test holes and wells would be sited, drilled and tested for capacity and hydraulic parameters. During Phase 2, multi-day pumping tests would be conducted at each test-production well individually to refine estimated hydraulic parameters and assess any resulting changes in local groundwater levels. Finally, Phase 3 would assess regional changes to groundwater levels through aquifer performance testing during the 2009 irrigation season (typically April through August). Each phase of the aquifer testing plan will be implemented within the institutional and management framework of the Glenn County Groundwater Management Plan (GMP), with input from the Glenn County Water Advisory Committee (WAC) and Technical Advisory Committee (TAC). Additional information on the Glenn County GMP and WAC is included in Appendix B.

All groundwater pumped under the SCF APTP would be used for irrigation or habitat maintenance in the SCF Partners' service areas. None of this groundwater would be used outside of these service areas, either directly or indirectly through a groundwater-substitution program.

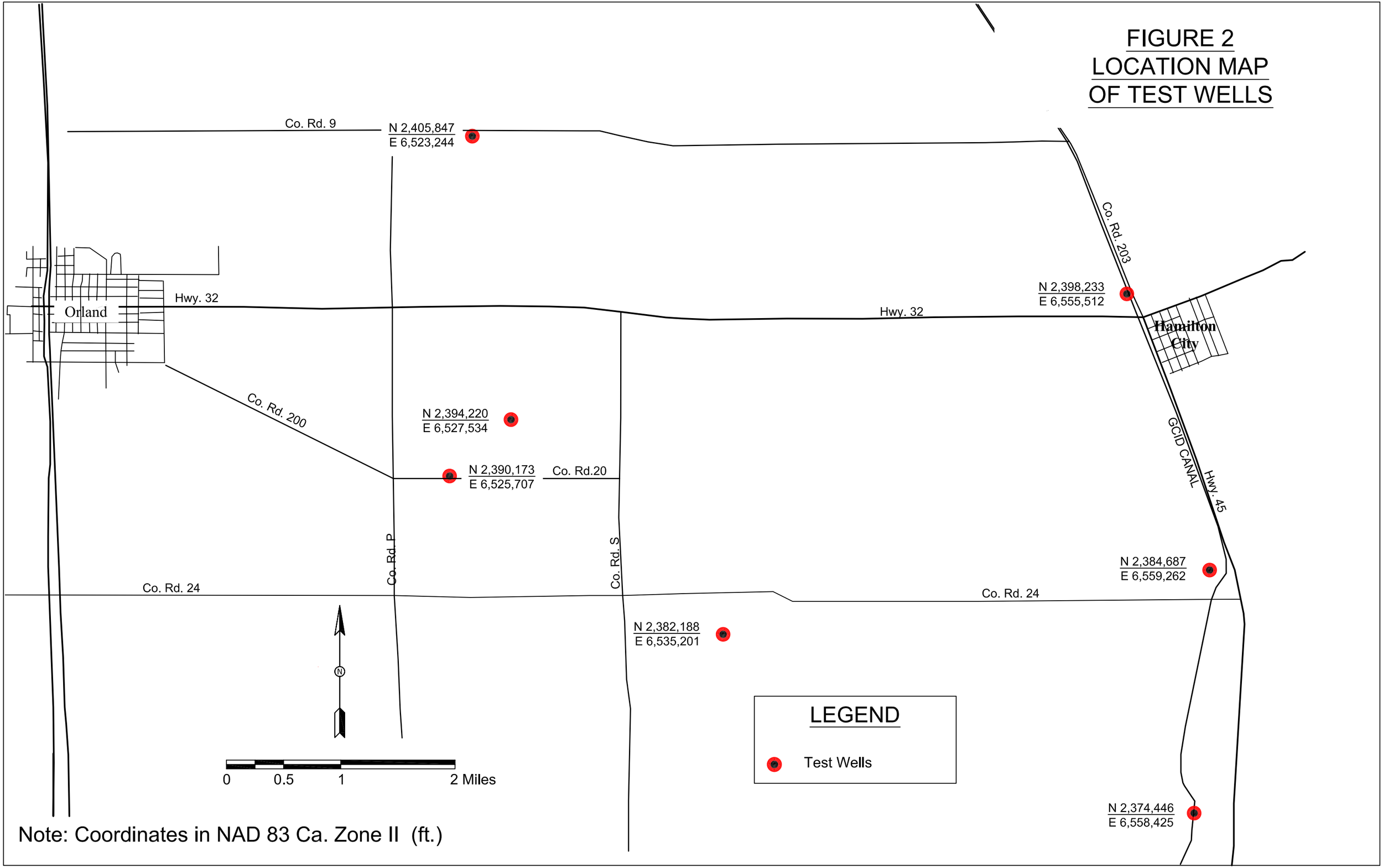
2.2.1.2 Test-Production Well Construction

The SCF Partners plan to drill up to five test holes and construct up to seven test-production wells. It is anticipated that the test-production wells would produce groundwater from geologic units at depths ranging from approximately 700 to 1,500 feet below ground surface (bgs). The anticipated geologic units from which groundwater will be pumped are the Plio-Pleistocene Tehama and Tuscan Formations. Figure 2 shows the locations of the proposed test-production wells.

The test holes would be drilled for the purpose of obtaining direct information on the geologic formations in the immediate vicinity of the proposed test-production wells. Test hole data would be used to finalize the design of the test-production wells and help support efforts to establish the regional geologic framework for the area, including the depths and thicknesses of the Tehama and Tuscan Formations and the location of the contact between the two formations.

The test holes and test-production wells would be drilled using a large truck-mounted reverse circulation rotary drilling rig equipped with a mud pump, pipe rack, and drilling fluid holding tank/shaker system. Geologic and geophysical data collected during the drilling of the test holes would be used to supplement information developed by the DWR Northern District and other researchers to describe the hydrogeologic framework of the groundwater basin. Data to be collected would include but may not be limited to the following activities:

FIGURE 2
LOCATION MAP
OF TEST WELLS



Note: Coordinates in NAD 83 Ca. Zone II (ft.)

- Review previous geologic exploration and well-logs in the vicinity.
- Collect samples of drill cuttings at 10 foot intervals.
- Conduct grain-size distribution analysis to support gravel-pack/screen size selection.
- Conduct geophysical surveys of the test hole, including digital logs of spontaneous potential (SP), 16 inch normal (short normal)/ 64 inch normal (long normal) resistivity, single point resistance, natural gamma ray, and temperature measurements, and X Y caliper with deviation.
- Conduct flow meter and down hole video camera surveys.
- Measure groundwater flow rates during pumping.
- Measure groundwater level fluctuation.

Test-production well construction at each site would occur 24 hours per day, seven days per week for approximately one week. Other drilling and testing activities would be conducted during normal work hours.

Additional support vehicles including a water tender, front-end loader, pipe truck, and pickup trucks would be parked on-site. The drilling rig and associated equipment would occupy an area of approximately 100 feet by 100 feet. Access for these vehicles would be directly off the adjacent paved road. No improvements for site access would be required. No off-site discharge of drill cuttings or fluids would occur. Drill cuttings and inert bentonite clay, produced during drilling operations, would be contained in an on-site settling pond and spread on site in an approved location upon well completion.

The surface completions for each test-production well would consist of an 8 by 10 feet concrete pad, pump-house enclosure and 20 inch discharge pipe. The test holes would be either converted to multi-completion monitoring wells or abandoned in accordance with Glenn County requirements. The GCID and OUWUA wells would be located adjacent to irrigation canals. The discharge pipes of the GCID and OUWUA wells would be routed from the well sites to the canals, then down the canal bank slopes. Discharge would be at the edge of the canal water prism. The discharge piping for OAWD wells would be plumbed from each well site into an existing underground pipeline conveyance system. The typical test-production well construction diagram is shown in Figure 3. Drilling of test holes and construction of test-production wells is scheduled to begin in late 2008 and be completed by early 2009.

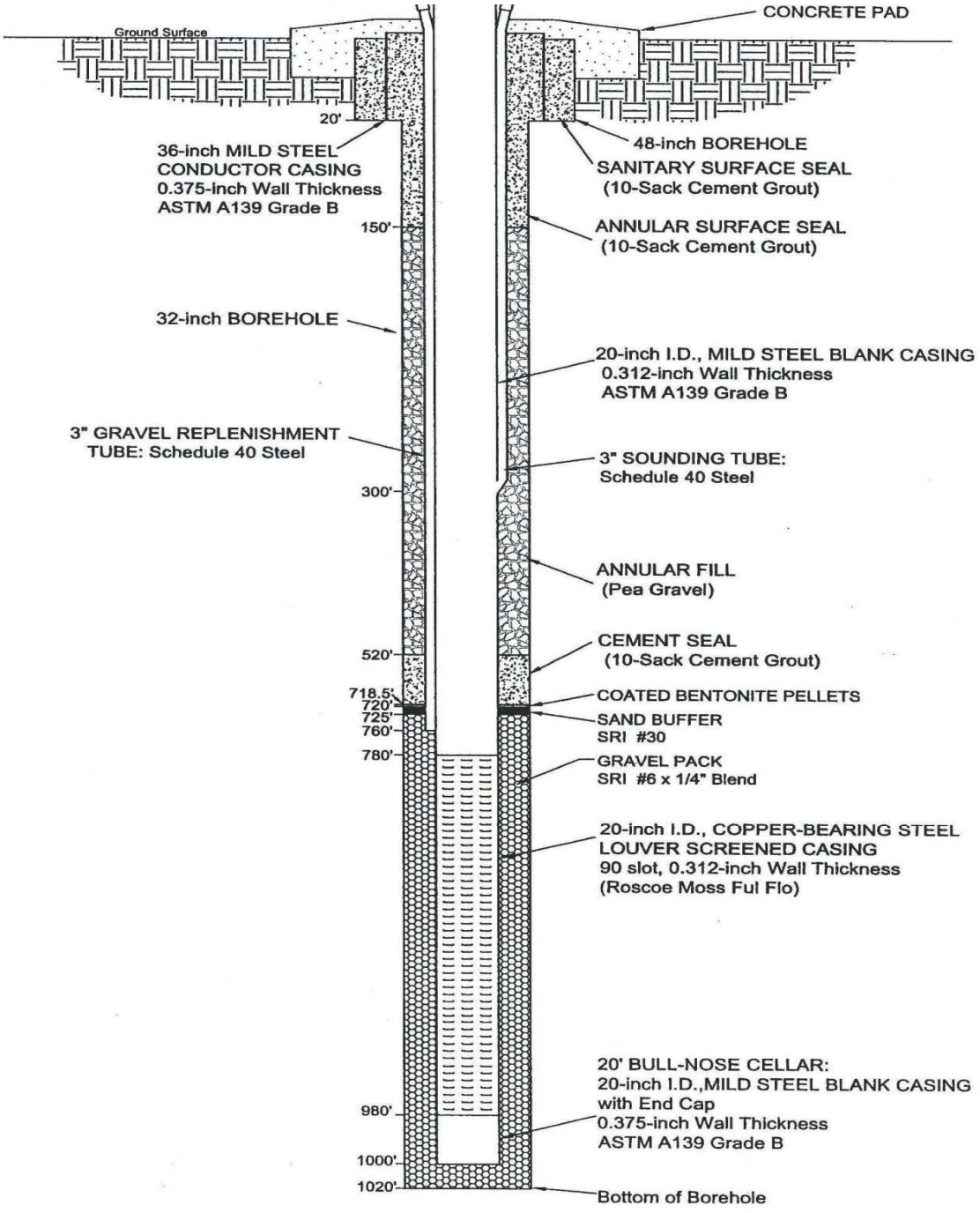


Figure 3.
Typical Test-Production Well Construction Diagram

2.2.1.3 Aquifer Testing Implementation

2.2.2.3.1 Aquifer Testing Phases

The purpose of the test-production wells is to assess the aquifer system's responses to pumping at rates and schedules similar to those expected if groundwater use is expanded as a component of the SCF Partners' water supply. Local effects in the vicinity of each test-production well can be assessed by aquifer testing of each well individually, and this type of testing is included in the APTP. However, basin-scale aquifer responses that could potentially result in adverse impacts in future scenarios involving expanded conjunctive use are not measurable by short duration testing of a single test-production well. Therefore, operational testing of up to seven test-production wells is also included in the APTP to provide a mechanism to collect data that can be used to assess the potential basin-scale effects of the expanded use of groundwater in the future.

Aquifer testing will be implemented in three phases to allow progressive refinement of the testing approach as more information becomes available.

These phases are briefly described below and discussed in detail in the following sections:

- Phase 1 – At the conclusion of test-production well construction at each location, specific capacity and hydraulic parameters would be estimated by performing 12 to 24 hour constant rate testing at each well. Information gathered during Phase 1 would be used to help ensure Phase 2 pumping rates and durations result in measurable water level changes at observation wells, but do not result in significant impacts.
- Phase 2 – Multi-day tests would be conducted at each well individually to refine hydraulic parameter estimates and assess potential groundwater level changes. Information gathered during Phase 2 would be used to help ensure Phase 3 pumping rates and durations result in measurable water level changes at observation wells, but do not result in significant impacts.
- Phase 3 – Potential basin-scale effects would be measured by performing up to two seasons of operational testing. Phase 3 testing would involve simultaneous operation of multiple wells, because the intent is to observe the effects of their combined operation on the aquifer system.

Frequent and detailed monitoring would be performed during each phase of the testing to meet data collection requirements. The data and information compiled during implementation of this aquifer testing plan would be used as input prior to SCF Partners approving the integration of the wells into the SCF Partners' water supply systems for long term use and production. Integration of the wells for any long term use would require future environmental review.

Phase 1 – Step and Constant Rate Testing During Well Construction

Standard industry practice calls for step and constant rate pump testing near the conclusion of the well construction process. These tests are used to assess the capacity of the well and size pumping equipment. The pumping capacity of each well would depend on the hydraulic

parameters of the aquifer system, well construction, and the amount of drawdown that is considered acceptable in each well, based on operational requirements and well efficiency. The hydraulic parameters of the aquifer and well characteristics are fixed after a well is constructed, and the capacity depends on the amount of drawdown that is considered acceptable. The acceptable level of drawdown in the well depends on a variety of site-specific conditions that cannot be fully assessed prior to well construction and testing. Therefore, the hydraulic properties of the aquifer around each well, and the capacity of each well would be assessed using temporary well development equipment near the conclusion of the well construction effort.

Step testing would be conducted to estimate the specific capacity of each well. The step test is conducted by pumping the well in a series of steps in which the pumping rate is incrementally increased at specified time intervals. The step test is a short duration test that takes no more than a day to complete at each well. The step test results would be used to prepare data graphs of: a) drawdown versus pumping rate, and b) drawdown and well efficiency versus pumping rate. Based on this information, the SCF Partners would select the pump and electric motor to be installed in each well.

Estimates of the hydraulic parameters – transmissivity and storage coefficient – in the near vicinity of each well are necessary for calculating estimates of the extent of drawdown in the vicinity of the well as a function of pumping rate and duration. Initial estimates of the transmissivity at each well location would be made using the Theis recovery method applied to a 12 to 24 hour constant discharge rate test of each well. The Theis recovery method is a standard method used to calculate transmissivity from the water level recovery data obtained from a pumped well as it recovers after being pumped at a known, constant rate for a specified period of time. The method is based on the Theis analytical solution to the groundwater diffusion equation for time-dependent flow to a well penetrating a confined aquifer. The storage coefficient cannot be calculated using this approach, and would be estimated from hydrogeological data. If a monitoring well is located near the test-production well, drawdown measured in the monitoring well would be used to calculate the transmissivity and storage coefficient using the Theis equation. It is anticipated that the test-production wells would be tested at flows ranging from about 1,500 to 4,000 gallons per minute (gpm). During the Phase 1 testing, the amount of groundwater pumping per well would be approximately 10 acre-feet, or a total of about 70 acre-feet for all seven wells. The amount is based on an estimated test duration of 1 day, and an average test pumping of 2,300 gpm (1000 gpm=4.42 acre feet/day).

Phase 2 – Multi-Day Well Testing

The objectives of the multi-day constant rate tests are to: (1) estimate the hydraulic parameters of the aquifer system over a wider radius than assessed in 12 to 24 hour constant rate testing performed in Phase 1; (2) assess potential effects on groundwater levels at specific observation well locations in the vicinity of each test-production well; and (3) provide a basis for planning target production rates and operational schedules for the Phase 3 operational testing of the wells. The multi-day well testing is scheduled to occur when groundwater pumping by others is limited (between the 2008 and 2009 irrigation seasons). The purpose of this scheduling is to allow collection of test data with minimal interference from other pumping wells, and minimize the potential to impact other pumping wells. During the Phase 2 testing, the maximum amount of

groundwater pumped would be approximately 540 acre-feet per well, with a maximum total of 3,780 acre-feet combined for all seven wells. The amount is based on a test duration of 30 days and pumping rate of 4,000 gpm.

The initial estimates of the zone of influence of each test-production well developed during Phase 1 would be used to design multi-day constant rate aquifer tests appropriate for the site-specific conditions near each test-production well. Test design would include:

- Evaluation of the Phase 1 results and framework geology in the test area
- Identification of potentially relevant aquifer depth zones to be monitored with existing/proposed multi-completion monitoring wells.
- Identification and evaluation of other wells in the vicinity
- Layout of the monitoring network,
- Selection of the pumping rate, and the duration of testing.

The monitoring network would include DWR, Glenn County, and SCF Partners' monitoring wells, and other nearby monitoring wells and production wells as appropriate. Monitoring well locations are shown on Figure 4.

An initial estimate of the extent of drawdown around each well is needed to identify existing production wells that may potentially be affected by multi-day pumping of the test-production wells, and to identify monitoring wells that may be used to measure drawdown induced by pumping of each test-production well. The initial estimate of the extent of drawdown would be calculated using an appropriate analytical solution to the groundwater flow equation. This would enable calculation of estimated drawdown over extended areas, pumping periods and varying aquifer conditions. Inputs would be the target production rate, initial estimates of aquifer hydraulic parameters, aquifer thickness and other geological data and well information available from DWR Northern District.

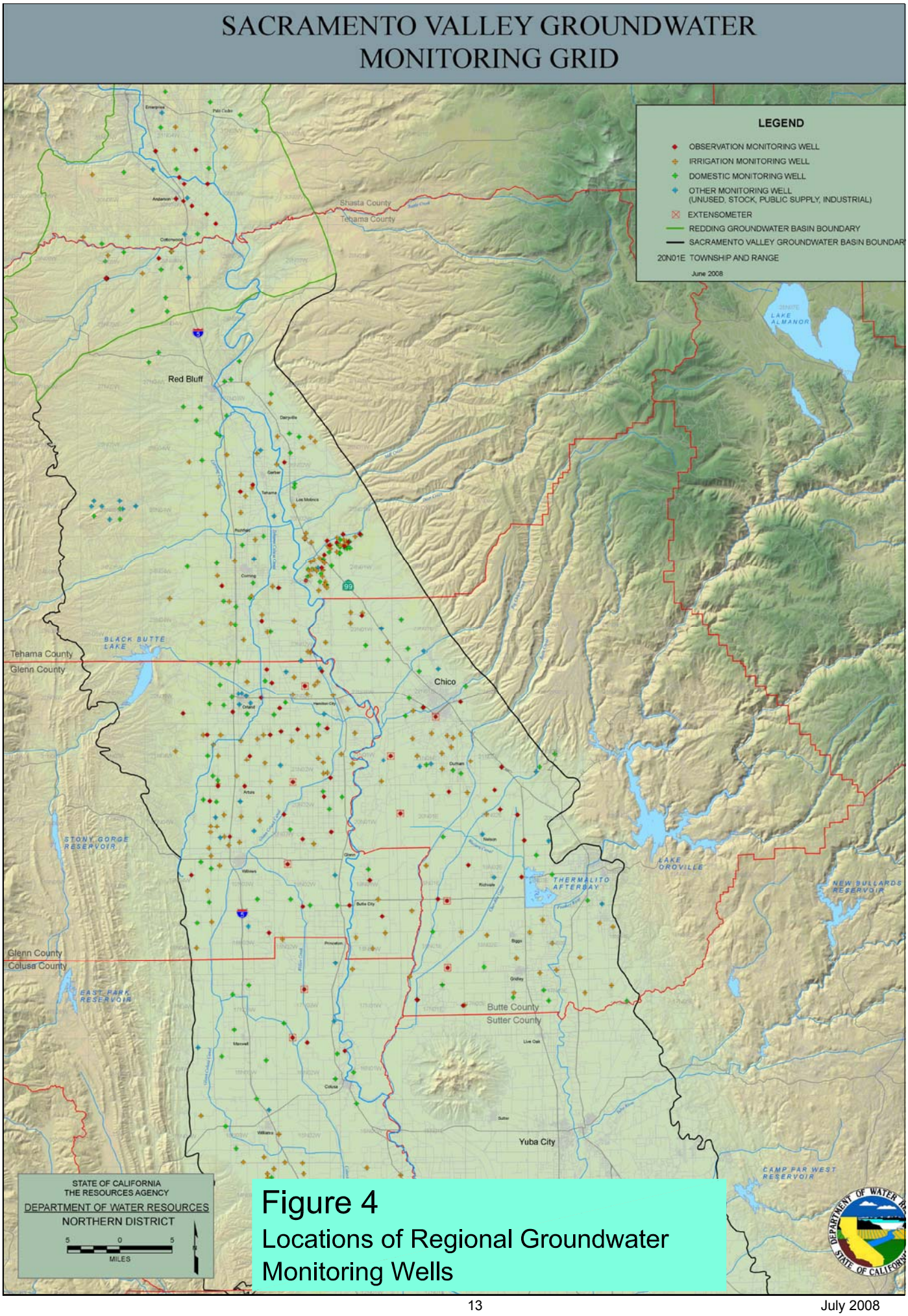


Figure 4
Locations of Regional Groundwater Monitoring Wells

Phase 3 – Operational Testing

The test-production wells will be operated during the 2009 irrigation season as follows:

1. On or about May 1, the wells would be turned on. The water developed from the wells would be used on lands located within the SCF Partners' respective areas.
2. The Partners would collaborate with DWR Northern District and Glenn County WAC and TAC on the aquifer testing plan.
3. Monitoring data would include flow rates for each of the test-production wells; depth to groundwater measurements in the test-production wells and observations wells in the vicinity; depth to groundwater measurements in critical areas of the groundwater basin, including recharge areas and areas in which groundwater resources are considered limited; extensometer measurements; and land subsidence benchmark repeat surveys, if available.
4. The wells would be operated at an assumed capacity of 4,000 gpm (1000 gpm=4.42 acre feet/day) for approximately six months for a maximum total pumping volume of about 3,240 AF per well, or a total of 22,680 AF for all seven wells. As stated previously if such monitoring indicates a significant decline in groundwater levels in the relevant vicinity of the test pumps, and that any such decline is not directly attributable to a cause other than the pilot testing project, then the test pumping would be modified or terminated as necessary to avoid any significant adverse impacts.

2.2.2.3.2 Reporting

The aquifer testing program described in this document would contribute to building the body of knowledge regarding northern Sacramento Valley hydrogeology, aquifer system performance and the potential to develop and use groundwater in a responsible, sustainable manner. Data gathered during the three test phases described above would be made available to all interested parties through DWR Northern District, subject to DWR's protocols for data quality control and publication. Progress would be reported at regularly scheduled Glenn County WAC and TAC meetings. An interim report summarizing test results through December 2008 would be issued during the first quarter of 2009. A final report that documents the tests performed, the data collected, and the results of data analysis would be the end of 2009.

2.2.1.4 Right of Use Application and Warren Act Contract(s)

If the United States is not going to be holding title to the new features (i.e. production wells) in the proposed action, then 43 CFR 429 is applicable and a Right of Use (ROU) contract must be executed, regardless of the other actions. The analysis in this environmental assessment covers Reclamation's execution of a ROU for well installation on the federal right of way. Specifically, the wells proposed for construction in the OUWUA would be sited on federal property. Therefore, a ROU is required for use of the federal right of way. Under the ROU, the Stony Creek Fan Partners would be required to reimburse Reclamation for any administrative costs associated with the Proposed Action and use fees shall be waived.

Under Section 1 of the Warren Act, act of February 21, 1911, 36 Stat. 925, the Secretary of the Interior, is authorized, upon such terms as he may determine to be just and equitable, to contract

for the impounding, storage, and carriage of water to an extent not exceeding such excess capacity with irrigation systems operating under the Carey Act, and individuals, corporations, associations, and irrigation districts organized for or engaged in furnishing or in distributing water for irrigation. Reclamation's only authority under which to allow the conveyance and/or storage of non-Project agricultural water in Project facilities is via the Warren Act. In this case, Reclamation has determined that a Warren Act contract is not necessary for the diversion of groundwater, since the pumped groundwater would only be used within the OUWUA. If the water were diverted outside the OUWUA service area boundaries, a Warren Act contract would be executed and further environmental analysis would be completed for the action

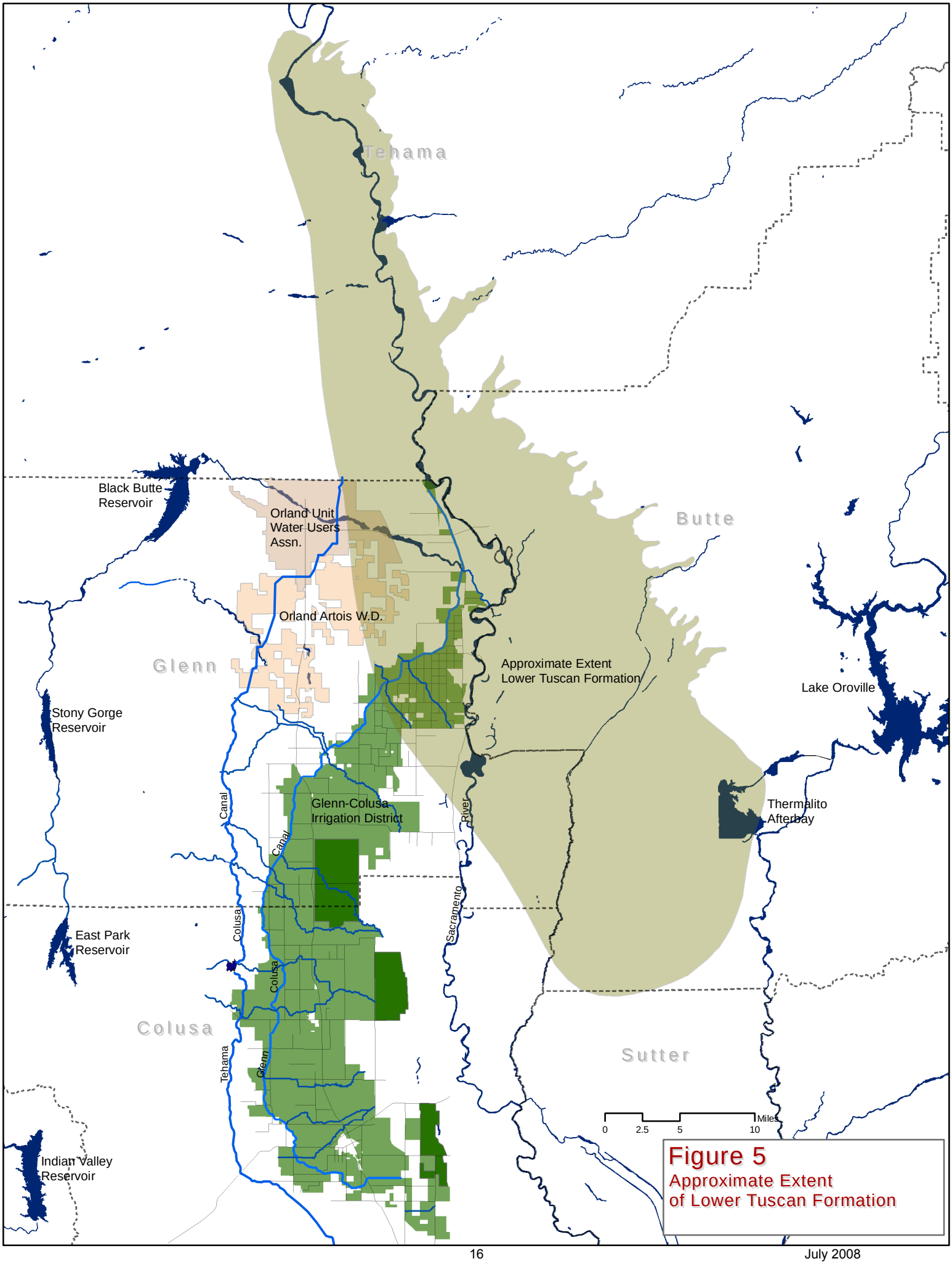
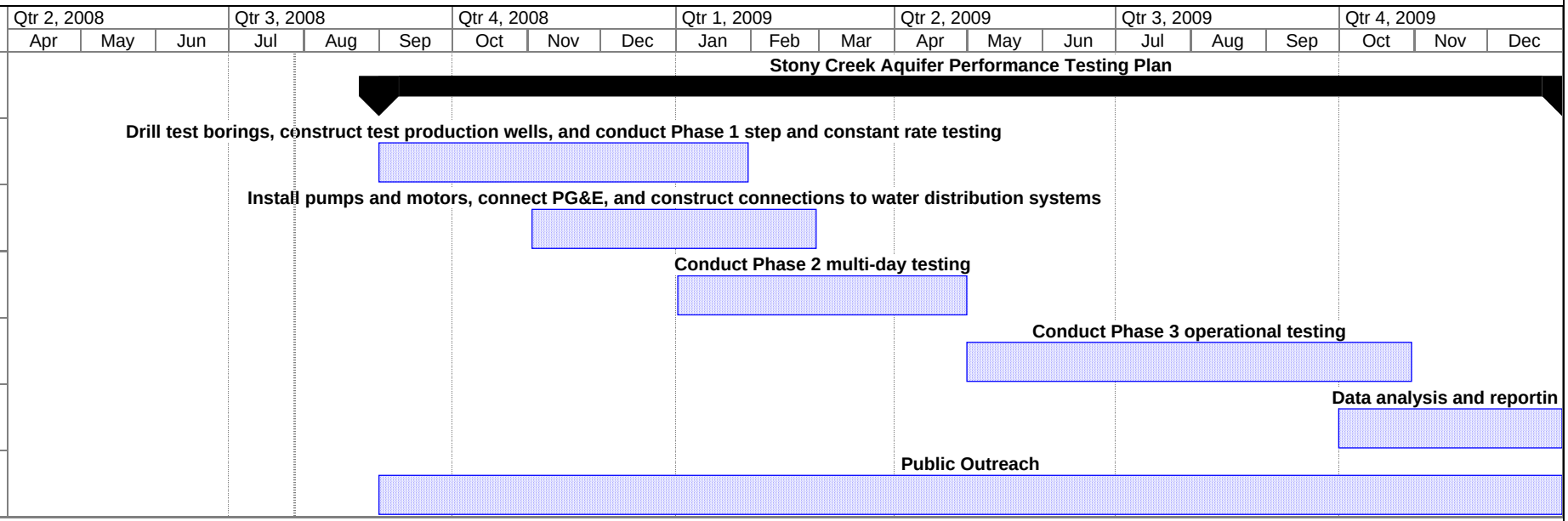


Figure 5
Approximate Extent
of Lower Tuscan Formation

2.2.2 Implementation Schedule

The schedule for implementing the proposed SCF APTP is shown on Figure 6. Under the SCF APTP, the SCF Partners are attempting to have the drilling, construction, and Phase 1 testing of the test-production wells completed between September 2008 and January 2009. An exception would be test well #5, which may need to be installed in the spring of 2009, after April 1, in order to avoid potential impacts to the giant garter snake. Installation of pumps, motors, and electric power would immediately occur following installation and Phase 1 testing of each well. Phase 2 testing could be conducted January through April, before the 2009 irrigation season begins. This schedule would allow adequate time for Phase 2 testing to be completed when groundwater pumping by others is minimal. The aquifer responses to test-production well pumping can be more readily distinguished and quantified when groundwater pumping is minimal. Phase 3 aquifer testing is scheduled to take place during the 2009 irrigation season from approximately May through October.

Firgure 6. Stony Creek Fan Aquifer Performance Test Plan Schedule



Section 3 Affected Environment and Environmental Consequences

3.1 *Surface Water Resources*

3.1.1 Affected Environment

The Sacramento River and Stony Creek are the two primary surface water features in the SCF Program study area (Figure 7). The Sacramento River drains the north central portion of California, including the western slope of the Sierra Nevada, the southern slope of Mount Shasta and the eastern slope of the Coast Range. It has a total length of 384 miles and is California's longest and largest river, carrying nearly one-third of the state's total water runoff. The federal Central Valley Project's (CVP) Lake Shasta is the principal impoundment on the River. It is located north of the city of Redding and has a capacity of 4.5 million acre-feet.

Stony Creek is tributary to the Sacramento River near Hamilton City, draining the east slope of the Coast Range. Its flows are regulated by three reservoirs. East Park and Stony Gorge Dams and Reservoirs were constructed in the early 1900's as part of the federal Orland Project. They have capacities of about 50,000 acre-feet each and release stored water for irrigation within the Orland Project. Black Butte Dam and Reservoir were constructed by the Corps of Engineer in the early 1960s primarily for flood control. Black Butte is financially integrated and operationally coordinated with the two Orland Project reservoirs.

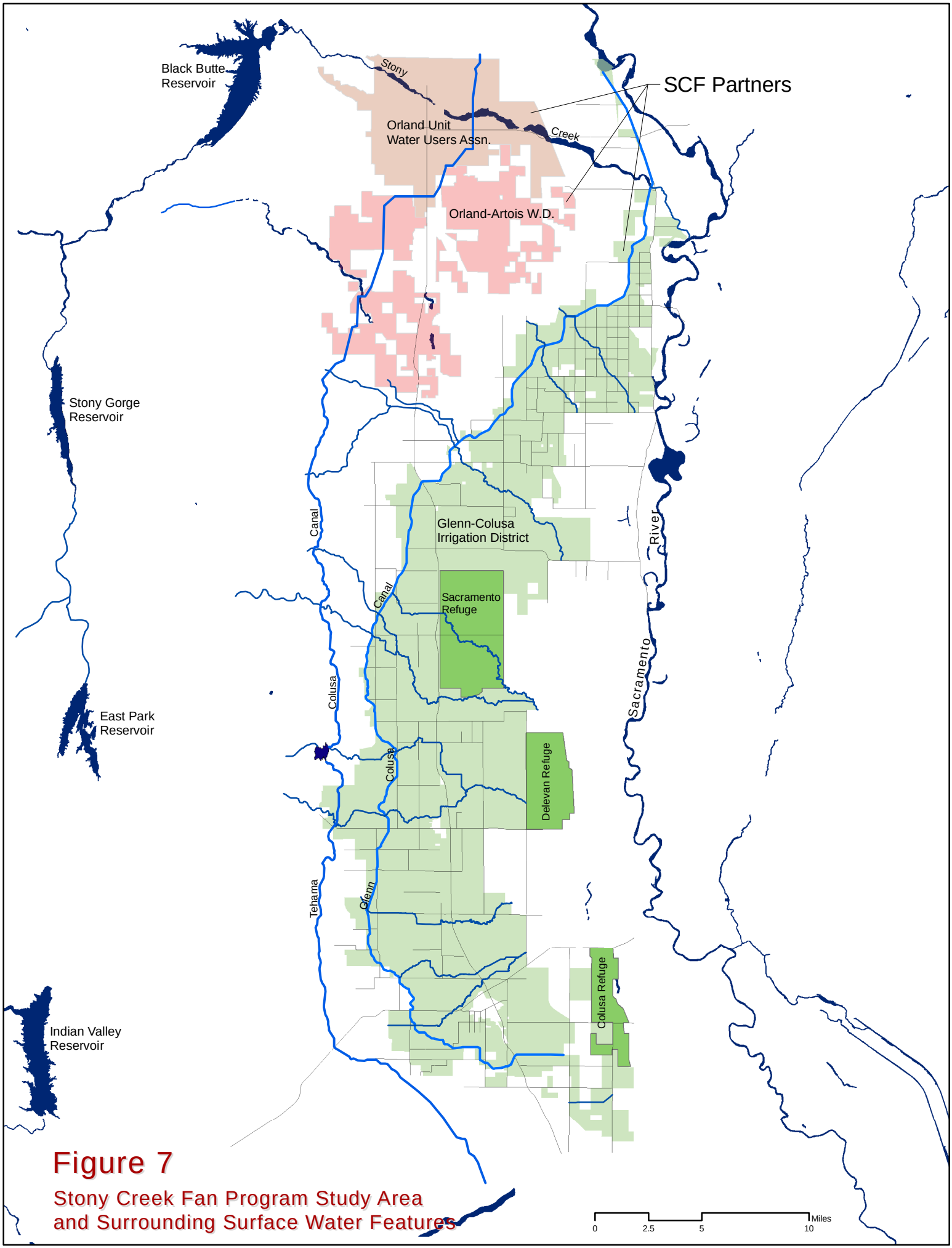


Figure 7

Stony Creek Fan Program Study Area and Surrounding Surface Water Features

3.1.1.1 Glenn-Colusa Irrigation District

GCID is the largest irrigation district in the Sacramento Valley with about 141,000 acres of agricultural land and 20,000 acres of managed waterfowl habitat with a gross service area of about 175,000 acres. GCID's main surface water facilities include the 3,000 cubic feet per second (cfs) Sacramento River Pump Station located north of Hamilton City, a 65-mile main canal, and about 900 miles of distribution laterals and drains.

The Sacramento River is GCID's primary water supply source. GCID holds pre- and post-1914 water rights to divert natural flow from the River. Pursuant to a negotiated agreement (settlement contract) with Reclamation, GCID may divert up to 825,000 acre-feet annually from the Sacramento River, including 720,000 acre-feet of base supply and 105,000 acre-feet of CVP project water. GCID also holds water rights to divert water from various other streams, including Stony Creek and the Colusa Basin Drain. Water supplied by GCID is used for irrigation, rice straw decomposition and maintenance of water fowl habitat. GCID does not provide water for municipal or industrial uses.

3.1.1.2 Orland-Artois Water District

OAWD was formed in 1954 for the purpose of contracting with the Bureau of Reclamation (Reclamation) for a supplemental surface water supply from the CVP. The District consists of 28,988 gross acres interspersed with non-District lands in a checkerboard-like pattern. The District's CVP water supply contract is for a maximum of 53,000 acre-feet annually, subject to shortages as determined by Reclamation. Because the demand for surface water typically exceeds the available contract supply, the District purchases additional surface water supplies in most years under short-term water transfer provisions, depending on availability and price, to augment available contract supplies. All water is delivered for irrigation. OAWD does not provide water for municipal or industrial uses.

The District water distribution system consists of about 100 miles of buried pipelines ranging in diameter from 8 to 96 inches. It was constructed over the period 1976 through 1983. The system is supplied from five permanent and three temporary turnouts from the Tehama-Colusa Canal (TCC), with a combined delivery capacity of about 427 cfs. About 16,767 acres are located down-gradient from the TCC and are served by gravity. The remaining 12,221 acres are up-gradient and are served by electrically powered canal side pumping plants. Water deliveries began in 1977.

3.1.1.3 Orland Unit Water Users Association

The Orland Unit Water Users Association (OUWUA) is a non-profit California Corporation formed in 1906. The OUWUA successfully petitioned Reclamation (then the United States Reclamation Service) to develop the Orland Project, construction of which began in 1909. East Park Dam and Reservoir were completed in 1910, and Stony Gorge Dam and Reservoir were completed in 1928. Operation of East Park Reservoir and Stony Gorge Reservoir is coordinated with operation of the Corps of Engineers Black Butte Reservoir located downstream as needed to meet irrigation demands within the Orland Project. An average of 100,000 AF of surface water is distributed through 17 miles of open main canals and 137 miles of open laterals for irrigation of about 17,600 acres within the OUWUA's 20,200 acre area. OUWUA does not provide water for municipal or industrial uses.

3.1.2 Environmental Consequences

3.1.2.1 No Action

Under the No Action alternative, the SCF Partners would continue to divert and distribute surface water in the respective operations as they have historically, pursuant to the water right and contractual terms governing their respective surface water supplies. Individual water users would continue to use water the way they presently do.

3.1.2.2 Proposed Action

Under the proposed action, each of the SCF Partners would operate their surface water distribution systems as the ordinarily do, but with the groundwater produced from the test-production wells integrated into system operation. There would be no modification of the surface water distribution systems or change in service areas. Phase 1 and Phase 2 pumping would not interfere with irrigation season surface water deliveries. Groundwater produced during Phase 1 and Phase 2 testing would be used to meet demands to the extent possible, as these test phases are scheduled to occur outside the irrigation season when demands are low. Any test water that could not be delivered to water users would be safely discharged for the surface water system to local drains, although the quantities would be small because Phase 1 and 2 test durations are relatively short.

In the test Phase 3, the test-production wells would be operated during the 2009 irrigation season. This would allow all groundwater produced during this test phase to be delivered to water users. No water would be delivered outside of the service areas of the SCF Partners, either directly or through exchange. In GCID and OUWUA, assuming the availability of a full surface water supply in 2009, surface water diversion and use would be reduced by the amount of groundwater pumped for testing. In the event that 2009 surface water supplies are limited due to dry hydrologic conditions, all the groundwater pumped by GCID and OUWUA for test purposes would be used to augment available surface water supplies. OAWD typically experiences surface water shortages nearly every year, so groundwater pumped for test purposes would expand the total quantity of water provided by the district, with the effect of reducing the amount of groundwater pumped by landowners to augment district by approximately 6,000 acre-feet. Table 1 provides the total supplies made available for each phase of the project. .

During the 2009 irrigation season, GCID's surface water diversions could be augmented by up to 23,865 acre-feet combined for test phase 3. If GCID receives a 100% allocation from Reclamation, surface water not diverted by GCID would be available for diversion by other surface water users in the basin, or would contribute to Delta outflow, depending on flow timing. If Reclamation imposes a 25% allocation reduction, GCID's supply would be reduced by 206,250 acre-feet and the groundwater from test phase 3 could be used to partially offset the shortage. The changes would not adversely impact surface water resources.

In OAWD, surface water supplies are generally not sufficient to meet surface water demands, so reductions in surface water use would not occur. Instead, surface water deliveries would be augmented with groundwater. Groundwater would increase OAWD's CVP contract supply by 6,000 acre-feet. The extra water would be used for agriculture. The increase would not adversely impact surface water resources.

In OUWUA, following test Phase 2, the test-production wells would be connected to the District's open canal system, making it possible to deliver the groundwater to District water users. The approximately 14,800 acre-feet of groundwater produced during test Phase 3 (2 seasons at 7,400 acre-feet per season) would be used to augment available surface water supplies during the irrigation season. This would result in a reduction in releases of stored surface water from East Park and Stony Gorge Reservoirs. Stored water would be used for Orland Project supply in subsequent years or to augment Stony Creek flows, depending on flow timing. The changes in surface water deliveries would not result in adverse impacts to surface water resources.

3.1.2.3 Cumulative Impacts

The Proposed Action would not contribute to cumulative impacts because of the limited duration of the Proposed Action and the fact that no adverse impacts to surface water resources would result from implementation of the Proposed Action.

3.2 *Groundwater and Geologic Resources*

3.2.1 Affected Environment

The SCF Program Study Area lies with the northern portion of the Colusa Subbasin (#5-21.52) and the southern portion of the Corning Subbasin (#5-21.51) as designated by the Department of Water Resources (Figure 8) (DWR, 2003) [Bulletin 118 Update 2003]. Both subbasins overlie basement bedrock that rises in the west to form the Coast Range Mountains and in the east to form the Sierra Nevada Mountains. Stratigraphy underlying the test area is characterized by Holocene alluvial deposits, Pleistocene deposits, and Pliocene deposits that form different geologic formations. Groundwater occurs in varying degrees of confinement, typically behaving as unconfined conditions in the alluvial deposits and becoming partially confined at greater depths.

The Pliocene Tehama Formation consists of sediments originating from the coastal mountains and is the primary source of groundwater produced in the area (DWR, 2003). The Tehama Formation ranges from 200 to several hundred feet in thickness within the area. The Tehama Formation generally behaves as a semi-confined aquifer system, although the nature of its communication with adjoining formations has not been characterized.

The Pliocene Tuscan Formation lies beneath the Tehama Formation in places in the eastern portion of the SCF Program Study Area, although its extent is not well defined. Based on best available information, it is believed to occur at depths ranging between approximately 300 and 1,000 feet below ground surface. It is thought to extend and slope upward toward the east and north, and to outcrop in the Sierra Nevada foothills. The Tuscan Formation is comprised of four distinct units: A, B C and D (although Unit D is not present within the general project area). Unit A, or Upper Tuscan Formation, is composed of mudflow deposits with very low permeability and therefore is not important as a water source. Units B and C together are referred to as the Lower Tuscan Formation. Very few wells penetrate the Lower Tuscan Formation within the SCF Program study area.

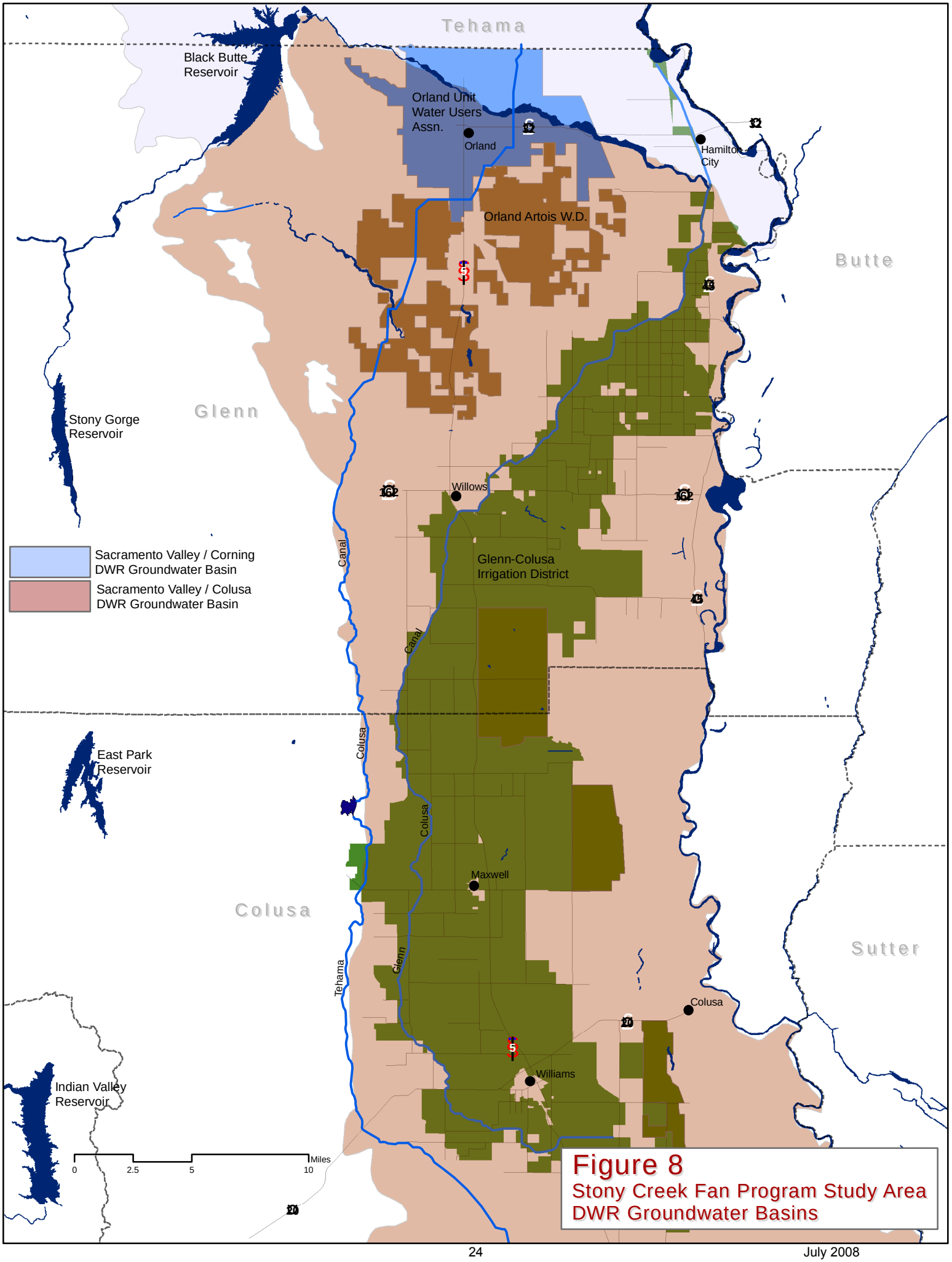


Figure 8
Stony Creek Fan Program Study Area
DWR Groundwater Basins

3.2.1.1 Glenn-Colusa Irrigation District

Because of GCID's large and relatively reliable surface water supplies, groundwater is not extensively developed or used within the District. However, there are about 200 private groundwater wells within the District, which are used by individual farmers to augment GCID surface water supplies in dry years, and in situations were farmers prefer to use groundwater rather than surface water. Most private wells draw primarily from the Tehama Formation, although the typical well drilling practice is to perforate wells at all levels where water bearing strata are found. Thus, private wells may draw from aquifers above the Tehama Formation and from deeper aquifers depending on well depth. Average annual private pumping in the northern portion of GCID (the portion in Glenn County) is estimated to be 11,000 acre-feet for the period 1970 through 2000 (Davids Engineering, 2006).

In selected years, GCID uses a voluntary, incentive based program to encourage private well owners to produce groundwater to supplement District surface water supplies. This involves paying well owners on a volumetric basis to operate their wells and to forego using an equal volume of District water, thereby expanding the total available water supply. The maximum seasonal production from this program was 67,000 acre-feet in 1992, which was used to meet local needs within GCID, and also to decrease the amount of surface water diverted which was transferred to meet statewide water needs.

GCID has constructed two District-owned groundwater test-production wells in recent years, one completed in 1985 and the other in 2005. Both wells are located in the general vicinity of the proposed test wells and are part of the District's ongoing efforts to better define groundwater conditions within the District, with particular emphasis on the lower aquifer system. DWR Northern District assisted GCID with the design, construction, and testing of the 2005 well for the purpose of collecting data that would help define the characteristics of the lower aquifer systems and groundwater conditions in the vicinity of the well. This included conducting a 28-day constant-discharge test in spring 2007 during which time water levels were observed and recorded in neighboring monitoring wells. One of the observation wells is a quadruple completion well located about ¼-mile from the test-production well, constructed at about the same time as the test-production well. The main conclusions drawn by DWR from the observations made during construction and testing are that the lower aquifer system is capable of producing large quantities of water, it behaves like a confined aquifer, and that the effects of test pumping were localized. DWR recommends conducting additional constant rate pumping test of the 2005 test-production well during the non-irrigation season to enable more precise interpretation of responses observed in observation wells.

3.2.1.2 Orland Artois Water District

Although it is not known how many private groundwater production wells exist in OAWD, water supply-demand analyses indicate that substantial quantities of groundwater are produced by private pumpers each year to augment the District's available surface water supplies to meet irrigation demands. Between 1984 (when the District distribution system was completed and CVP surface water deliveries reached full scale) and 2000, average private pumping was estimated to be 21,000 acre-feet annually, or about 0.8 acre-feet per acre. Based on general information about private well depths, the large majority of private pumping is believed to be from the Tehama Formation.

The District completed construction of one lower aquifer test-production well in 2005 and has operated the well for water supply and testing purposes each irrigation season since then. The well is 1,320 feet deep with solid casing to a depth of 590 feet and with multiple screened intervals below that depth. It is equipped with a 200 horsepower electric motor. Water level in the well is between 70 and 80 feed below ground surface (bgs) during the non-irrigation season and draws down within days of the start of pumping to between 200 220 feet bgs. Initial well production is about 3,000 gpm and declines as drawdown increases, stabilizing at between 1,800 and 2,000 gpm. Thus far, well operation has had no discernable effects on performance of neighboring private wells.

3.2.1.3 Orland Unit Water Users Association

The Orland Project has a highly reliable surface water supply. Consequently, groundwater is not extensively used or developed within the Project. Pumping from private groundwater wells is estimated to have averaged just 3,000 acre-feet during the period 1970 through 2000 (Davids Engineering, 2007), or about 0.15 acre-feet per acre. Although OUWUA typically has a reliable and adequate water supply to deliver to its farmers, its 100-year old distribution system can only accommodate rotational irrigation deliveries that do not provide necessary flexibility to support modern irrigation techniques required for most perennial crops. Consequently, there is an increasing trend of Orland Project lands being planted to orchards and irrigated by drip and sprinkler systems supplied by groundwater wells.

3.2.2 Environmental Consequences

3.2.2.1 No Action

Under the no action alternative, groundwater development and use would continue as it presently does within the respective service areas of the SCF Partners.

3.2.2.2 Proposed Action

Under the proposed action, groundwater would be produced from the lower aquifer system to facilitate the aquifer tests, as previously described in Section 2.2.2.2. The lower aquifer system includes water bearing strata in the Lower Tuscan formation and lower portions of the Tehama formation. All groundwater produced by the test-production wells would be discharged into the three SCF Partners' respective surface water distribution systems and integrated with surface water operations. Some of the relatively minor amounts of water produced in test Phases 1 and 2 may be discharged from the distribution systems to local surface water drains if it cannot be used as water supply. All of the groundwater produced in test Phase 3 would be used for irrigation.

The estimated volumes of groundwater that would be produced per test-production well during the three test phases are tabulated below. This is followed by discussion of the effects of the proposed test pumping on the SCF Partner's surface water resources.

Table 1. Estimated Groundwater Pumping Durations, Rates and Volumes by Test Phase per Test-Production Well

Test Phase	Approximate Pumping Duration (days)	Assumed Average Pumping Rate (gallons per minute)	Estimated Groundwater Volume (af)/well	Total Groundwater Volume (af) - based on 7 wells
1 – Constant Rate Test	1	2,300	10	70
2 – Multi-day Test	30 days	4,000	540	3,780
3 – Operational Test	180 days	4,000	3,240	22,680
		Total =	3,790	26,530

In GCID, all groundwater produced during aquifer testing would be discharged into GCID's main canal, commingled with surface supplies and delivered to users for irrigation, rice straw decomposition, or maintenance of waterfowl habitat. For the three test-production wells scheduled for construction within GCID, the total volume of test pumping would be 11,370 acre-feet, including 30 acre-feet in test Phase 1, 1,620 acre-feet in test Phase 2 and 9,720 acre-feet in test Phase 3.

In OAWD, the approximately 1,100 acre-feet of groundwater produced by the two test-production wells during aquifer test Phases 1 and 2 would be discharged to open drains or delivered to district lands located near the test-production well sites. Following test Phase 2, the test-production wells would be connected to the District's pipeline distribution system, making it possible to deliver the groundwater to District water users. The approximately 6,480 acre-feet of groundwater produced during test Phase 3 would be used to augment available surface water supplies during the irrigation season. This would have the effect of reducing private groundwater pumping by an equivalent amount.

In OUWUA, the approximately 1,110 acre-feet of groundwater produced by the two test-production wells during aquifer test Phases 1 and 2 would be discharged into the surface water distribution system and either delivered to Orland Unit lands or discharged to local drains. The approximately 6,480 acre-feet of groundwater produced during test Phase 3 would be used to augment available surface water supplies during the irrigation season.

In GCID and OUWUA, the aggregate Phase 3 pumping would be 18,500 acre-feet per season. In OAWD, test pumping from the lower aquifer system would enlarge the District's water supply, resulting in a reduction of pumping from private wells in the overlying Tehama Formation and other shallower aquifers. As noted previously, the total volume of test pumping from the two test-production wells is estimated to be 6,480 acre-feet over single-season test period. Although the intent of the operational testing (Phase 3) is to produce measurable effects, the magnitude and duration of these effects would not be sufficient to cause adverse impacts or result in a serious or major disturbance to groundwater resources. If monitoring indicates a significant decline in groundwater levels in the relevant vicinity of the test pumps, and that any

such decline is not directly attributable to a cause other than the proposed action, then the test pumping would be modified or terminated as necessary to avoid any significant adverse impacts.

Increased use of groundwater in Glenn County by the SCF Partners under future conjunctive use scenarios could potentially affect groundwater levels, water quality, surface water/groundwater interactions, and rates of inelastic land subsidence. These potential impacts could extend beyond the SCF Partners' service areas. The Glenn County Groundwater Management Plan provides the management and institutional framework for assessing and managing these potential impacts, and is incorporated in this plan by reference.

DWR Northern District performed a multi-day constant discharge aquifer test in the existing test-production well 22N02W02J001M during spring 2007. The test-production well was pumped at a near-constant rate of approximately 3,500 gpm for 28 days (approx. 433 acre-feet). Preliminary results from the test indicate that drawdown effects were evident in wells monitoring the deeper aquifer systems (approximately 650 feet to 1,000 feet below ground surface) at a distance of two miles, but were not evident in the next closest deep aquifer monitoring well at a distance of five miles. Thus, the deep aquifer radius of influence associated with the 2007 deep aquifer testing is estimated to be between three to five miles. Shallow aquifers in the vicinity of the deep aquifer pumping well showed no apparent response to the deep aquifer pumping. The closest multi-completion monitoring well, at a distance of about 0.3 miles, showed no evidence of groundwater level decline in aquifer zones screened above approximately 650 feet. A copy of the test report is available from DWR Northern District.

DWR monitors groundwater levels in over 100 single and multi-completion observation wells throughout the northern Sacramento Valley on a quarterly basis, as well as in over 300 irrigation and domestic wells semi-annually (Figure 4). Continuous groundwater level data loggers are installed in the majority of observation wells monitoring the various aquifer zones that are pumped in the northern Sacramento Valley.

These existing observation wells would be used to monitor pumping effects induced by the test-production wells whenever possible. Several of the test-production well locations are within a three- to four-mile radius of existing DWR observation wells.

Because the majority of observation wells have been installed in the last ten years, groundwater levels measured by domestic and irrigation wells over longer time periods would also be used to evaluate seasonal and multiyear groundwater level fluctuations. These data are maintained by DWR and are available to the public via internet access through the DWR Water Data Library (http://wdl.water.ca.gov/gw/).

DWR has eight extensometers in the Sacramento Valley that measure land subsidence. Additionally, Butte, Colusa, Glenn and Tehama counties have established a Global Positioning System land subsidence network. The subsidence data would be reviewed to identify any changes that occur during the test pumping, and to determine if there is any causal connection.

3.2.2.3 Cumulative Effects

Groundwater supply data collected as part of DWR Bulletin 160-05 indicates that approximately 1,200,000 acre-feet of groundwater is extracted from the Sacramento Valley portion of Butte, Colusa, Glenn and Tehama Counties during a normal water year[6]. Operational testing associated with this pilot-scale program is only estimated to pump a maximum volume of 26,530 acre-feet[7] (Table 1) in one irrigation season, or approximately two percent of the regional average annual groundwater extraction. Analysis also indicates that some of this pumped groundwater would recharge the aquifer system due to infiltration along conveyance systems and deep percolation associated with applied groundwater. Based on water balance analysis, an estimated 9,000 acre-feet of water may be recharged to the aquifer system.

Because the Proposed Action would be of limited duration (2 years) and would represent only a small increase (2%) in groundwater pumping from the basin during the active portion of the test, and would be modified or terminated based on monitoring data to avoid significant adverse impacts to groundwater, there would be no cumulative impacts to groundwater resources as a result of the Proposed Action.

3.3 *Land Use*

3.3.1 Affected Environment

Land use within the test area is primarily for irrigated agriculture and waterfowl habitat. Principal crops include rice, orchards, alfalfa, and a variety of other field and forage crops. Willows and Orland are the two largest communities lying within or near the test area, each having populations of slightly more than about 6,500 in 2000 (U.S. Census Bureau). The total population of Glenn County was 26,453 in 2000.

3.3.2 Environmental Consequences

3.3.2.1 No Action

Under the No Action alternative, ongoing land use would continue in the SCF Program Study Area.

3.3.2.2 Proposed Action

Under the Proposed Action alternative, construction of each test-production well would occur within an area of approximately 100 feet by 100 feet (0.23 acres) and the completed test-production well facilities would occupy a smaller area within the construction zone.

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[6] Groundwater supply estimates based on data developed by Department of Water Resources Northern District for the DWR Bulletin 160-05 Water Plan. Estimates were calculated based on actual water year 2000 (normal water year) for the area consisting of Butte, Colusa, Glenn and Tehama Counties. Based on water balance analyses conducted in relation to the SCF Feasibility Investigation for the 1970 through 2000 period (Technical Memorandum No. 3, Davids Engineering, 2006).

[7] Volume of pumping is based on 7 wells each producing 4,000 gallons per minute, which is equivalent to 18 acre-feet per day. The duration of testing would be 30 days per month for 7 months (April – October).

The total land area affected by test-production well construction would be approximately 0.001 percent of the land area served by the SCF Partners. Changes in land use would not occur as a result of the Proposed Action. Therefore, the Proposed Action would not impact existing land use.

3.3.2.3 Cumulative Impacts

Since the Proposed Action would not impact existing land use, it would not contribute to cumulative impacts on land use.

3.4 *Air Quality*

3.4.1 Affected Environment

The SCF Program Study Area falls within the Sacramento Valley Air Basin (SVAB) as designated by the California Air Resources Board, which is administered by the Glenn County Air Pollution Control District. The SVAB includes all or portions of 11 counties, including all of Butte, Colusa, Glenn and Tehama Counties. The basin is bounded on the east, west and north by mountains that restrict air movement, sometimes resulting in the accumulation of air pollutants. When air stagnates in the basin, air pollution levels can accumulate to unhealthy levels. In 2000, the California 8-hour ozone standard was exceeded on 42 days and the PM10 standard was exceeded on 45 days (California Air Resources Board website). Carbon monoxide standards were not exceeded. On-road motor vehicles are the largest source of smog forming air pollution emissions in the basin.

The air quality attainment status of the four counties closest to the test area is summarized in Table 2.

Table 2. Status of Air Quality Attainment for Butte, Colusa, Glenn and Tehama Counties (Source: California Air Resources Board)

	Air Pollutant		
County	Ozone	PM10	Carbon Monoxide
Butte	Non-attainment	Non-attainment	Attainment
Colusa	Non-attainment-Transitional	Non-attainment	Unclassified
Glenn	Non-attainment-Transitional	Non-attainment	Unclassified
Tehama	Non-attainment	Non-attainment	Unclassified

3.4.2 Environmental Consequences

3.4.2.1 No Action

Under the No Action Alternative, there would be no change to existing air quality conditions, regulation, or attainment of standards.

3.4.2.2 Proposed Action

Under the Proposed Action, there would be temporary effects on air quality due to emission of air pollutants from diesel and gasoline powered equipment during the period of construction. Table 3 lists the type of equipment and hours of operation that would be used during the 3-day

pilot hole drilling phase and the 9-day test production well construction phase. Prior to the project construction, the contractor to the project would be responsible for obtaining permits, if required, from the local Glenn County Air Pollution Control District. Combined, there is an estimated 789 hours of equipment operation required for the construction of the proposed wells. About 95% of the equipment operation is associated with diesel engines and the remainder with gasoline engines. All of the diesel engines burn road grade diesel except the Ingersol Rand air compressor which burns off-road diesel. Total fuel consumption during test hole drilling is estimated to be 400 gallons, and during well construction is estimated to be 1,200 gallons. There would be temporary emissions (impacts) resulting from the use of the construction equipment. The wells are electric and would not contribute any impacts to air quality.

Table 3. Equipment and Estimated On-site Hours Operation for Well Construction (per well)

Equipment Description	Year Model	Engine Make	Engine Model	Fuel Type	Horsepower	Estimated Hours of Operation During Construction Period
Test Hole Drilling (3-day construction period)						
International Drill Rig	1999	Cummins	N14	Diesel	439	72
EDC Shaker	2001	Deutz Air Cooled	BF914	Diesel	98	68
Magnum Lite Tower	2003	Isuzu	3LB1	Diesel	26	36
					Subtotal hours of operation	176
Well Construction (9-day contruction period)						
Western Star Drill Rig	1991	LTA10 Cummins	LTA10	Diesel	265	200
Ingersol Rand Comp	2007	QSC 8.3 Cummins	QSA 8.3	Diesel	280	168
CAT 430 Backhe	2003	Caterpillar	3054C	Diesel	93	25
Magnum Lite Tower	2002	Isuzu		Diesel	26	100
Miller Welder DXL300	2000	Kubota	DH905B	Diesel	26	16
Miller Welder DXL300	2002	Kubota	DH905B	Diesel	26	16
Eaton Conveyor	2000	Case	4T390	Diesel	98	48
Eaton Conveyor	2000	Honda	6X390	Gasoline	13	24
Miller Bobcat Welder	2008	ONAN Engine	CH20	Gasoline	15	16
					Subtotal hours of operation	613
					Total hours of operation	789

3.4.2.3 Cumulative Impacts

Although there are temporary impacts to air quality as a result of the Proposed Action, the magnitude of those impacts would not contribute to long term, cumulative impacts on air quality.

3.5 *Biological Resources*

3.5.1 Affected Environment

Agriculture
Agriculture, irrigated with water drawn from the Sacramento River, dominates the surrounding landscape. Principal crops include rice, orchards (walnut, almond, olive), alfalfa, and a variety of other field and forage crops. These crops are irrigated by either a series of canals (OUWUA and GCID) or through underground piping (OA) that delivers water from the Sacramento River or Stony Creek. The delivery canals within the action area are generally well maintained and concrete lined, and support minimal vegetation. There is one unlined drainage ditch which is lacking emergent aquatic vegetation such as cattails (*Typha latifolia*) and tules (*Scripus californicus*) that occurs in the vicinity of proposed well #5 (Appendix C Photo 7). All ditches owned and managed by SCF Partners are maintained throughout the year, and generally lack dense upland or aquatic vegetation.

All proposed action components are located in or adjacent to agriculture. The delivery canals that are proposed for conveyance of groundwater are surrounded by lands in active crop production. The Glenn-Colusa canal is not a lined canal, but supports a maximum flow capacity of 3,000 cfs. The water diverted from the Sacramento River into the Glenn-Colusa Canal moves through a state of the art fish screen facility, which prevents the entrainment of fish.

Wetland
There are no vernal pools or seasonal wetlands that occur within the proposed construction action areas. A search on the California Natural Diversity Database indicated no presence of wetlands within the USGS 7.5 minute quadrangles of Kirkwood, Ord Ferry, Hamilton City, Foster Island, and Orland. These quadrangles encompass all of the well locations identified in the action area (BA Appendix A).

Riparian
There are no riparian habitats that occur in the proposed construction action areas. The closest riparian habitats would be the Stony Creek to the north of well #6, and the Sacramento River, north and east of the proposed action areas.

Developed/Disturbed
Developed and disturbed areas include major roads, highways, and buildings and structures within more urban areas, but also facilities and access roads which are located throughout agricultural areas near each proposed well location. Also included within this category are the unpaved turnouts and shoulders of dirt access roads.

Wildlife
The following list was obtained on June 10, 2008 by accessing the U.S. Fish and Wildlife database: http//www.fws.gov/sacramento/es/spp_list.htm (080411031358). This list is for the following 7 ½ minute U.S. Geological Survey quadrangles:

Ord Ferry (577B)

Hamilton City (578A)
Orland (578B)
Foster Island (594D)
Kirkwood (594C)

Listed Species

Invertebrates

- *Branchinecta conservatio*
  - Conservancy fairy shrimp (E)
- *Branchinecta lynchi*
  - vernal pool fairy shrimp (T)
- *Desmocerus californicus dimorphus*
  - valley elderberry longhorn beetle (T)
- *Lepidurus packardi*
  - vernal pool tadpole shrimp (E)

Fish

- *Acipenser medirostris*
  - green sturgeon (T) (NMFS)
- *Hypomesus transpacificus*
  - delta smelt (T)
- *Oncorhynchus mykiss*
  - Central Valley steelhead (T) (NMFS)
  - Critical habitat, Central Valley steelhead (X) (NMFS)
- *Oncorhynchus tshawytscha*
  - Central Valley spring-run chinook salmon (T) (NMFS)
  - Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
  - Critical habitat, winter-run chinook salmon (X) (NMFS)
  - winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- *Rana aurora draytonii*
  - California red-legged frog (T)

Reptiles

- ***Thamnophis gigas***
  - **giant garter snake (T)**

Candidate Species

Birds

- Coccyzus americanus occidentalis
  - Western yellow-billed cuckoo (C)

Although there are several species identified in the list, only those species that could potentially occur in the action area (proposed construction areas) are analyzed in detail. The giant garter snake (GGS) (*Thamnophis gigas*) is the only species with potential habitat in the action area.

3.5.2 Environmental Consequences

3.5.2.1 No Action

Under the no action alternative, conditions would remain the same as existing conditions. There would be no impacts to wildlife, including threatened and endangered species, their critical habitat, or general habitat types.

3.5.2.2 Proposed Action

The installation of test holes, production wells and the subsequent pumping and conveyance of groundwater would not affect aquatic species and/or their habitat. Habitat for Delta smelt, Chinook salmon (spring and winter run), central valley steelhead, or green sturgeon would not be affected, because no construction or flow modifications are proposed on natural waterways. All construction would tie into existing conveyance facilities (i.e. canals and underground pipes) The conveyance facilities to be used in the proposed action are not managed for fisheries. The groundwater pumped into the existing infrastructure would not be used outside the service areas of the SCF partners and would not impact species in the Sacramento River or Stony Creek. There would be no effect to federally listed fish species mentioned above and there would be no modification of critical habitat for the species as a result of the proposed action.

A biological assessment (BA) has been prepared under Section 7(a)(2) of the Endangered Species Act (ESA) for effects to the GGS (Appendix C). Reclamation has determined that the proposed action may affect, is not likely to adversely affect GGS. Potential effects to GGS or GGS habitat would be insignificant, due to the limited area and duration of disturbance under the proposed action. In addition, any impacts that may occur as a result of construction would be discountable or very unlikely, as only one proposed well site is located near potential habitat. The proposed location of well # 5 is near potential GGS habitat. However, California Natural Diversity Database search indicates no sighting of GGS in the action area (Appendix A Figure 1). The nearest CNDDB recorded sighting occurred in Ord Ferry, miles to the east of the proposed well #5 location.

During construction, avoidance and minimization measures would be followed to ensure minimal impacts to GGS. The measures include:

1. Avoid construction activities within the banks of potential GGS aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

2. Construction activity within known habitat areas should be conducted between May 1 and October 1. This is the active period for GGS and direct mortality is lessened because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

3. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided GGS habitat within or adjacent to the project area as Environmentally Sensitive Areas. These areas should be avoided by all construction personnel.

4. Construction personnel will receive Service-approved worker environmental awareness training. This training instructs workers to recognize GGS and their habitat(s).

5. 24-hours prior to construction activities, the project area should be surveyed for GGS, by a Fish and Wildlife Service approved biologist. The survey of the project area will be repeated if a lapse in construction activity of two weeks or great has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone (916) 414-6620.

6. After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions.

3.5.2.3 Cumulative Impacts

Implementation of the proposed action would not result in cumulative effects to biological resources. Even though there may be potential impacts to potential GGS habitat, those impacts are determined insignificant and discountable, under Section 7 of the Endangered Species Act, and, therefore would not contribute to cumulative impacts when added to other past, present or future foreseeable actions carried out by any other federal, state or local agency.

3.6 *Indian Trust Assets*

3.6.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the U.S. for federally-recognized Indian tribes or individual Indians. An Indian trust has three components: (1) the trustee, (2) the beneficiary, and (3) the trust asset. ITAs can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with trust land. Beneficiaries of the Indian trust relationship are federally-recognized Indian tribes with trust land; the U.S. is the trustee. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the U.S. The characterization and application of the U.S. trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions.

Consistent with President William J. Clinton's 1994 memorandum, "Government-to-Government Relations with Native American Tribal Governments," Bureau of Reclamation (Reclamation) assesses the effect of its programs on tribal trust resources and federally-recognized tribal governments. Reclamation is tasked to actively engage federally-recognized tribal governments and consult with such tribes on government-to-government level (59 Federal Register 1994) when its actions affect ITAs. The U.S. Department of the Interior (DOI) Departmental Manual Part 512.2 ascribes the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (DOI 1995). DOI is required to "protect and preserve Indian trust assets from loss, damage, unlawful alienation, waste, and depletion" (DOI 2000). Reclamation is responsible for assessing whether the proposed APTP has the potential to affect ITAs.

It is the general policy of the DOI to perform its activities and programs in such a way as to protect ITAs and avoid adverse effects whenever possible. The SCF Partners' proposed APTP would be implemented to ensure compliance with this policy. In addition, Reclamation would comply with procedures contained in Departmental Manual Part 512.2, guidelines, which protect ITAs.

The nearest ITA is the Paskenta Rancheria which is approximately 13 miles NW of the project location. In 2000, the Paskenta Band of Nomlaki Indians acquired a 2000-acre reservation near Corning and the construction of the Rolling Hills Casino on that Reservation. This ITA is located near the City of Corning in Tehama County, about 20 miles north of the SCF Program Study Area. .

3.6.2 Environmental Consequences

3.6.2.1 No Action

Under the no action alternative, there are no impacts to ITAs, as no new facilities would be constructed and existing operations would continue to operate as have historically occurred.

3.6.2.2 Proposed Action

There are no tribes possessing legal property interests held in trust by the United States in the water involved with this action, nor is there such a property interest in the lands designated to receive the water proposed in this action. The nearest ITA is the Paskenta Rancheria which is approximately 13 miles NW of the project location. There would be no impacts to ITAs as a result of Proposed Action.

3.6.2.3 Cumulative Effects

Because there are no impacts to ITAs as a result of the Proposed Action, the Proposed Action would not contribute to any cumulative impacts to ITAs.

3.7 *Environmental Justice*

3.7.1 Affected Environment

As mandated by Executive Order 12898 (E.O. 12898), published February 11, 1994, entitled, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations", this EA addresses potential environmental justice concerns. The population of some small communities in the Central Valley typically increases during late summer harvest. The market for seasonal workers on local farms draws significant numbers of migrant workers, commonly of Hispanic origin from Mexico and Central America.

3.7.2 Environmental Consequences

3.7.2.1 No Action

The No Action Alternative would have no impact on environmental justice. The SCF Partners would continue to manage their water supplies to meet the needs of water users within their respective service areas. Conditions would be the same as the existing conditions; therefore, no additional impacts are associated with this alternative.

3.7.2.2 Proposed Action

The Proposed Action involves a temporary test of the lower aquifer system and has no potential to affect the crops grown or the yields achieved on the irrigated land within the SCF Partners' service areas. The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease. The Proposed Action would not disproportionately impact economically disadvantaged or minority populations. No impacts relevant to Environmental Justice are anticipated because the project does not result in any change in operations that would affect the general public.

3.7.2.3 Cumulative Effects

Because the Proposed Action would have no impact on minority or disadvantaged populations, it would not contribute to cumulative impacts on those populations. There would be no cumulative impacts to Environmental Justice as a result of the Proposed Action.

3.8 *Cultural Resources*

3.8.1 Affected Environment

This section discusses the identification of cultural resources and the potential for well installation to affect historic properties. The Orland Unit Water User's Association (OUWUA), Orland-Artois Water District (OAWD), and Glenn-Colusa Irrigation District (GCID) propose to install seven test-production wells in Glenn County. The area of potential effects (APE) for cultural resources was determined to be an area measuring 100-foot by 100-foot at each of the seven test-production well sites (Table 4). Proposed well locations 1-4 have previously been drilled in preparation for installing a test-production well. Well locations 5-7 are proposed for test drilling to determine if they are suitable sites for test-production wells.

Table 4 Location of Test-Production Wells

	Location	Quadrangle	Facility
Well 1	NW¼NW¼ Sec. 18, T. 22 N., R. 2 W.	Kirkwood	Lateral 130, Orland Unit
Well 2	NW¼NW¼ Sec. 29, T. 22 N., R. 2 W.	Hamilton City	Lateral 60, Orland Unit
Well 3	NE¼NE¼ Sec. 30, T. 22 N., R. 2 W.	Orland	N of Road 20 in abandoned orchard tie to concrete sub-lateral? OAWD
Well 4	NW¼NE¼, Sec. 4, T. 21 N., R. 2 W.	Hamilton City	in almond orchard-what conveyance? OAWD
Well 5	unsectioned, T. 21 N., R. 1 W	Hamilton City	Glenn-Colusa Canal, GCID between berms of GCC and rice fields
Well 6	unsectioned, T. 21 N., R. 1 W	Hamilton City	Glenn-Colusa Canal, GCID berm at Stoney Creek siphon
Well 7	unsectioned, T. 22 N., R. 1 W	Hamilton City	Glenn-Colusa Canal, GCID on berm/ road

The Orland Project was authorized by the Secretary of the Interior in October 1907. The project incorporates parts of Glenn, Tehama, and Colusa Counties. The hub of the project is the town of Orland in northern Glenn County. The Orland Project is irrigated by Stony Creek, a tributary of the Sacramento River that drains the east side of the North Coast Range and comprises two main dams to store water (East Park and Stony Gorge), two diversion dams (Rainbow and Northside), 17 miles of canals, and 139 miles of laterals. The OUWUA has operated the project since October 1, 1954.

The OAWD was formed in 1954 for the purpose of contracting with Reclamation for a supplemental surface water supply from the CVP. The District consists of 28,988 gross acres interspersed with non-District lands in a checkerboard-like pattern. The OAWD water distribution system was constructed between 1976 and 1983 and consists of about 100 miles of buried pipelines ranging in diameter from 8 to 96 inches. The system is supplied from five permanent and three temporary turnouts on the Tehama-Colusa Canal (TCC).

The GCID (formerly the Central Irrigation District) was organized November 22, 1887, becoming the fourth irrigation district organized under the Wright Act of March 1887 (Davis 1984:10). Due to a great deal of litigation over water rights, financial constraints, and other impediments such as marketing irrigation water, the Central Irrigation District subsequently went through several management companies. Central Irrigation District was invalidated in 1893 as a

consequence of a legal technicality (Davis 1984:16). The Central Canal and Irrigation Company took over the irrigation system, followed by the Sacramento Valley Irrigation Company and Sacramento Valley West Side Canal Company. The Glenn-Colusa Irrigation District was formed in 1919 and began official operations on March 1, 1920. The GCID owns, operates, and delivers water through the 65-mile-long Glenn-Colusa Canal (GCC) into a complex system of over 900 miles of laterals and drains.

The only cultural resources identified within the APE are Orland Lateral 130, Orland Lateral 60, and the Glenn-Colusa Canal. Lateral 130 is a lateral of the North Canal, which originates at the Northside Diversion Dam. Northside Diversion Dam, completed in 1913, is on Stony Creek about 5 miles northwest of Orland (Reclamation 1961:574). Lateral 130 diverges to the south from the North Canal west of I-5 and is approximately 8.5 miles long. Lateral 60 is a sub-lateral of Lateral 40, which extends eastward from the South Canal in central Orland. Both Lateral 130 and Lateral 60 are lined with concrete. These two laterals have not be formally recorded or evaluated for NRHP eligibility.

The Glenn-Colusa Canal (GCC) is the main canal, and one of the first facilities built, within GCID. Construction of the GCC (formerly the Central Canal) was begun November 9, 1889 (Davis 1984:12). By November 1891, forty miles of the 65 miles of canal had been excavated before construction was halted. The Central Canal and Irrigation Company continued construction in 1904 and completed the Central Canal in 1908 (Davis 1984:19-20). The canal was designed to be about 6 feet deep with a bottom width of approximately 65 feet. The GCC has not been formally evaluated for NRHP eligibility.

Regulatory Setting

National Historic Preservation Act

The NHPA of 1966, as amended (16 USC 470 *et seq*.), is the primary Federal legislation that outlines the Federal Governments' responsibility to consider the effects of their actions on historic properties. The 36 CFR Part 800 regulations that implement Section 106 of the NHPA describe how Federal agencies address these effects. Historic properties are defined as those cultural resources listed, or eligible for listing, on the National Register of Historic Places. The term "cultural resources" is used to describe archaeological sites, illustrating evidence of past human use of the landscape; the built environment, represented by structures such as dams, roadways, and buildings; and resources of religious and cultural significance, including, but not limited to, structures, objects, districts, and sites. Historic properties include Traditional Cultural Places, which are resources of religious and cultural significance that are eligible for the NRHP by virtue of their traditional significance.

The criteria for National Register eligibility is outlined at 36 CFR Part 60. These criteria state that the "quality of significance in American history, architecture, archeology, engineering, and culture" must first be demonstrated by the property's "integrity of location, design, setting, materials, workmanship, feeling, and association." Additionally, in order to be a historic property, a "district, site, building, structure, or object" must meet at least one of the following four criteria.

(A) be associated with events that have made a significant contribution to the broad patterns of our history; or

(B) be associated with the lives of persons significant in our past; or

(C) embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) have yielded, or may be likely to yield, information important in prehistory or history.

If a cultural resource meets one of these criteria and has integrity, it is considered eligible for listing on the NRHP and, therefore, a "historic property."

Determination of Eligibility

Orland Laterals 130 and 60 have not been formally determined eligible for listing on the NRHP. Little of the Orland Project has been evaluated for its eligibility for inclusion on the National Register of Historic Places. Stony Gorge Dam is the only component that has been determined eligible for inclusion on the National Register under Criteria A and C. A project-wide evaluation of eligibility for the Orland Project has not yet been implemented due to funding constraints. Reclamation recognizes the significance of the Orland Project, the first federal water project entirely within California, as it applies to the themes of water conveyance and the development of agriculture in the west and, more specifically, in the northern Central Valley of California.

Reclamation's cultural resource staff is actively seeking funds to conduct a project wide determination of eligibility and historic context that would lead to a National Register nomination. In the interim, Reclamation assumes, for the purposes of this undertaking, that the Orland Project is eligible for inclusion in the National Register under Criterion A. Lateral 130 and Lateral 60 are assumed eligible as contributing features of the Orland Project pursuant to 36 CFR Part 60.4.

Reclamation determined that evaluating the GCC for listing on the NRHP is outside the scope of this undertaking. Therefore, for the purposes of this undertaking, Reclamation also assumes that the GCC is eligible for listing on the NRHP under Criterion A for its association with the early agricultural and economic development of Glenn County and the Sacramento Valley pursuant to 36 CFR Part 60.4.

3.8.2 Environmental Consequence

3.8.2.1 No action

The no action alternative would result in no historic properties affected pursuant to 36 CFR Part 800.4(d)(1).

3.8.2.2 Proposed action

The proposed installation of test-production wells 1-4 has no potential to affect historic properties pursuant to 36 CFR Part 800.3(a)(1). These test-production wells would be installed at sites previously drilled to determine if the sites were suitable for the wells.

The proposed installation of test production wells 5-7 would result in no adverse impacts to historic properties pursuant to 36 CFR Part 800.5(b). The proposed test drilling would not affect the qualities and characteristics that make the Glenn-Colusa Canal eligible for listing on the NRHP.

Reclamation's findings and determinations are pending review and concurrence by the California Office of Historic Preservation (SHPO).

Section 4 Consultation and Coordination

The CEQA document prepared by GCID, as appended hereto, was filed with the State Clearinghouse and the County Clerk for Glenn County in November 2007, and otherwise made available for public review. During preparation of this environmental assessment, the following agencies were coordinated with and/or assisted in preparing the document:

- U.S. Fish and Wildlife Service (Service)
- Glenn Colusa Irrigation District
- Orland-Artois Water District
- Orland Unit Water Users Association
- State of California Historic Preservation Office (SHPO)

Reclamation is consulting with the Service pursuant to the Endangered Species Act (ESA) for this action. ESA consultation with the FWS was initiated August 2008 and will be completed prior to finalization of this EA and FONSI. (Appendix C)
Reclamation is also consulting with SHPO pursuant to Section 106 of the National Historic Preservation Act (NHPA). Section 106 will be completed prior to finalization of this EA and FONSI.

Section 5 List of Preparers and Reviewers

Tamara LaFramboise, Natural Resource Specialist, Bureau of Reclamation
Rebecca Victorine, Natural Resource Specialist, Bureau of Reclamation
Amy Barnes, Archaeologist, Bureau of Reclamation
Patricia Rivera, Native American Affairs Officer, Bureau of Reclamation
Grant Davids, Davids Engineering
Thad Bettner, Glenn Colusa Irrigation District
Ben Pennock, Glenn Colusa Irrigation District

Section 6 References

DWR, 2003. *California's Groundwater Bulletin 118 Update 2003.*

DWR Water Data Library (http://wdl.water.ca.gov/gw/). Site accessed April 2008.

EDAW, 2006. *Analysis of Effects of the Greenbriar Project on Covered Species, Appendix P to the Draft Environmental Impact Report for the Greenbriar Development Project, Sacramento, California* (July 2006) SCH #2005062144 ("Greenbriar Report"). Reclamation

Glenn County Internet. http://www.countyofglenn.net. Groundwater management plan. Accessed June 2008.

U.S. Fish & Wildlife Service. 1999. *Draft Recovery Plan for the Giant Garter Snake* (*Thamnopsis gigas*). U.S Fish and Wildlife Service, Portland, Oregon. ix+ 192pp.

U.S. Fish &Wildlife Service, 2006. Sacramento Fish and Wildlife Office. *Giant Garter Snake (Thamnopsis gigas) 5-Year Review: Summary and Evaluation*

Appendix A – California Environmental Quality Act Compliance Document

NOTICE OF EXEMPTION

To: Vince Minto, Clerk-Recorder
526 West Sycamore Street
Willows, CA 95988

From: Glenn-Colusa Irrigation District
344 East Laurel Street
Willows, CA 95988
(530) 934-8881

Project Title: Plan for Aquifer Performance Testing of Geologic Formations Underlying Glenn-Colusa Irrigation District, Orland Artois Water District, and Orland Unit Water Users Association Service Areas, Glenn County, CA.

Project Location: Glenn County Township 22N, Range 1W, Projected Section 19 and Township 21N, Range 1W, Projected Sections 5 & 7, (all of the above in the Capay Rancho), Township 22N, Range 2W, Sections 18, 29 and 30, Township 21N, Range 2W, Section 4, MDB&M, California. (See map of Project Location attached hereto as Figure 2.)

Description of Nature, Purpose, and Beneficiaries of Project:

The Project will be carried out by Glenn-Colusa Irrigation District (GCID), Orland-Artois Water District (OAWD) and Orland Unit Water Users Association (OUWUA), and is a two-year research program in Glenn County to drill up to five test holes, install up to seven test-production wells, and to conduct well efficiency and aquifer performance testing. GCID, OAWD and OUWUA formed the Stony Creek Fan Program (SCF Program) in 2001 for the purpose of studying potential conjunctive use water programs. The Project, also known as the "Aquifer Testing Plan," is in furtherance of the SCF Program and will help characterize the extent and distribution of the multiple aquifer systems within the SCF Program study area. A summary of the Project is set forth below, but a full description of the Project is set forth in Exhibit A, attached hereto, and incorporated herein by reference.

The test-production wells will be constructed to focus production on the lower aquifer systems. The aquifer performance testing and monitoring will be conducted to help identify the aquifer properties surrounding the individual test-production wells, and the regional interaction between the lower and upper aquifer systems. In order to accomplish this goal, aquifer performance testing will be conducted using single and multiple test-production wells during irrigation and non-irrigation periods. Preliminary testing of the lower aquifer system was conducted during April and May of 2007. Based

on the 2007 test data and the proposed adaptive monitoring associated with this program, the drilling and testing associated with this work will not result in significant impacts to the aquifer systems, surrounding groundwater users, or environmental resources, and will not result in a serious or major disturbance to an environmental resource. Data collection and testing associated with this work will yield much needed information that will be used to identify future sustainable management alternatives for the integrated groundwater and surface water resources of the region. Any necessary further environmental review will be conducted before the SCF Partners approve the integration of the test-production wells into the SCF Partners' water supply systems for any long-term local, regional or broader uses.

The two-year research program will be implemented in three phases. During Phase 1, the wells will be sited, drilled and tested for capacity and hydraulic parameters. During Phase 2, multi-day pumping tests will be conducted at each test-production well individually to refine estimated hydraulic parameters and assess any resulting changes in local groundwater levels. Finally, Phase 3 will assess regional changes to groundwater levels through aquifer performance testing over the 2008 and 2009 irrigation seasons. The Phase 3 groundwater pumping in 2008 will be limited by the number of wells, that have been installed and which have completed Phase 2 testing. The maximum groundwater extraction for the Phase 3 portion of the testing program is 15,000 acre-feet during the 2008 irrigation season, and 26,000 acre-feet during the 2009 irrigation season. All groundwater pumped under this Project will be used for irrigation in the SCF Partners' service areas, and none of this groundwater will be used outside of these service areas, either directly, or indirectly through a groundwater-substitution program.

The data resulting from these testing activities will be made available to the public and will provide a better understanding of the aquifer systems. The data will be used to better understand the recharge and other characteristics of the aquifer system, and to refine calibration of the Stony Creek Fan Integrated Groundwater and Surface Water Model (SCFIGSM), which will be an important source of information from which to base future decisions regarding local and regional conjunctive water use.

Potential site impacts include minor disturbance of the ground surface within and adjacent to the drill location, and a temporary increase in noise levels during drilling and installation of the well. Minor disturbance of the shallow ground surface during drilling operations may result due to:

- Mobilization and demobilization of drilling equipment;
- Support vehicle traffic, i.e., cars, trucks, water tanker truck, dump truck, front end loader;
- Discharge of inert drilling fluids (mixture of native clay and/or bentonite clay and water);
- Discharge of drill cuttings (volume of cuttings is estimated at 245 cubic yards).

The only site with potential noise impacts to residences would be the Stony Creek

site, where the closest residence is located approximately 200 feet away. The SCF Partners will contact the residents and work with them to address any of their concerns regarding noise as needed.

Name of Public Agency Approving Project: Glenn-Colusa Irrigation District.

Other Participating Agencies: Orland Artois Water District and Orland Unit Water Users Association.

Name of Person or Public Agency Carrying Out the Project: Glenn-Colusa Irrigation District, Orland Artois Water District and Orland Unit Water Users Association.

Environmental Review Completed by: Glenn-Colusa Irrigation District.

Exempt Status: Categorical exemption under the California Environmental Quality Act ("CEQA") Guidelines for basic data collection (Section 15306). Categorical exemption for minor alteration of land (Section 15304). Categorical exemption for new construction of limited small new facilities (Section 15303).

Reasons Why the Project Is Exempt:

- Section 15306 - basic data collection, research, experimental management, and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. This exemption applies to all aspects of the Project, but especially to the two-year program to test the groundwater wells and collect the resulting data. An explanation of why the Project will not result in a serious or major disturbance to an environmental resource is set forth in Exhibits A and B, attached hereto and incorporated herein by reference. Exhibit A is a detailed plan describing all aspects of the Project. Exhibit B is a memorandum from hydrogeologist Kenneth Loy regarding why implementation of the Project will not cause a serious or major disturbance to an environmental resource or a significant impact on groundwater resources. Mr. Loy's memorandum also discusses the necessity of phasing the planning and the associated environmental review between the research activities contemplated in the SCF Aquifer Performance Test Plan and the actual implementation/use of the groundwater wells for potential future groundwater production.

- Section 15303 - Categorical exemption for new construction of limited small new facilities; installation of small new equipment and facilities in small structures; and conversion of the use of small existing structures. This categorical exemption applies to the construction or conversion and location of limited numbers of new small facilities or structures. This exemption applies to the physical facilities associated with the test-production wells. A description of those facilities is set forth in Exhibit A and demonstrates that the well facilities are small in size.

- Section 15304 - Categorical exemption for minor alteration in the condition of land,

such as grading, gardening, and landscaping. Section 15304 applies to minor public or private alterations in the condition of land, water, or vegetation that do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. This exemption includes grading on land with a slope of less than ten percent. This exemption applies to minor activities associated with installing the well facilities. Those activities are set forth in detail in Exhibit A.

Lead Agency Contact Person: Thaddeus L. Bettner, GCID General Manager, (530) 934-8881

Signature: Thaddeus L Bettner

Date Received for Filing at Glenn County: _____

cc: Barbara Castro, DWRND

07 NOV 13 AM 11:39

Appendix B – Additional Information on Glenn County Groundwater Management Plan and Water Advisory Committee

In this regard, Glenn County adopted a groundwater management plan that incorporates sub area-specific Basin Management Objectives (BMOs) to guide the sustainable use of high quality groundwater. Under the plan, the County adopts BMOs based on recommendations from the WAC. The WAC consists of representatives of Glenn County, water purveyors, and Board of Supervisors Private Pumper Areas. The WAC personnel are appointed by the County Board of Supervisors. The TAC is made up of County Board of Supervisor appointees nominated by the agencies and representatives of the Private Pumper Areas comprising the Water Advisory Committee. Sub-area-specific BMOs are adopted by water agencies and Board of Supervisors Private Pumper Areas for their respective areas. Development of the BMOs are subject to the constraint that management actions associated with a BMO in one sub area will not result in the failure to maintain a BMO in a separate sub-area. All BMOs are developed and implemented based on monitoring of the aquifer system's response to the annual pumping, as indicated by groundwater levels, water quality, and rates of inelastic land subsidence.

The SCF Partners are members of the WAC, and their service areas are identified sub-areas defined in the Glenn County Groundwater Management Plan. The aquifer test approaches described in this plan are consistent with the Glenn County Groundwater Management Plan, and the development of sub-area-specific BMOs for each SCF Partners' respective service area. The future use of groundwater by the SCF Partners will be guided by the overall goals of the Glenn County Groundwater Management Plan, and the goals of the sub-area-specific BMOs.

Appendix C – ESA Consultation Biological Assessement